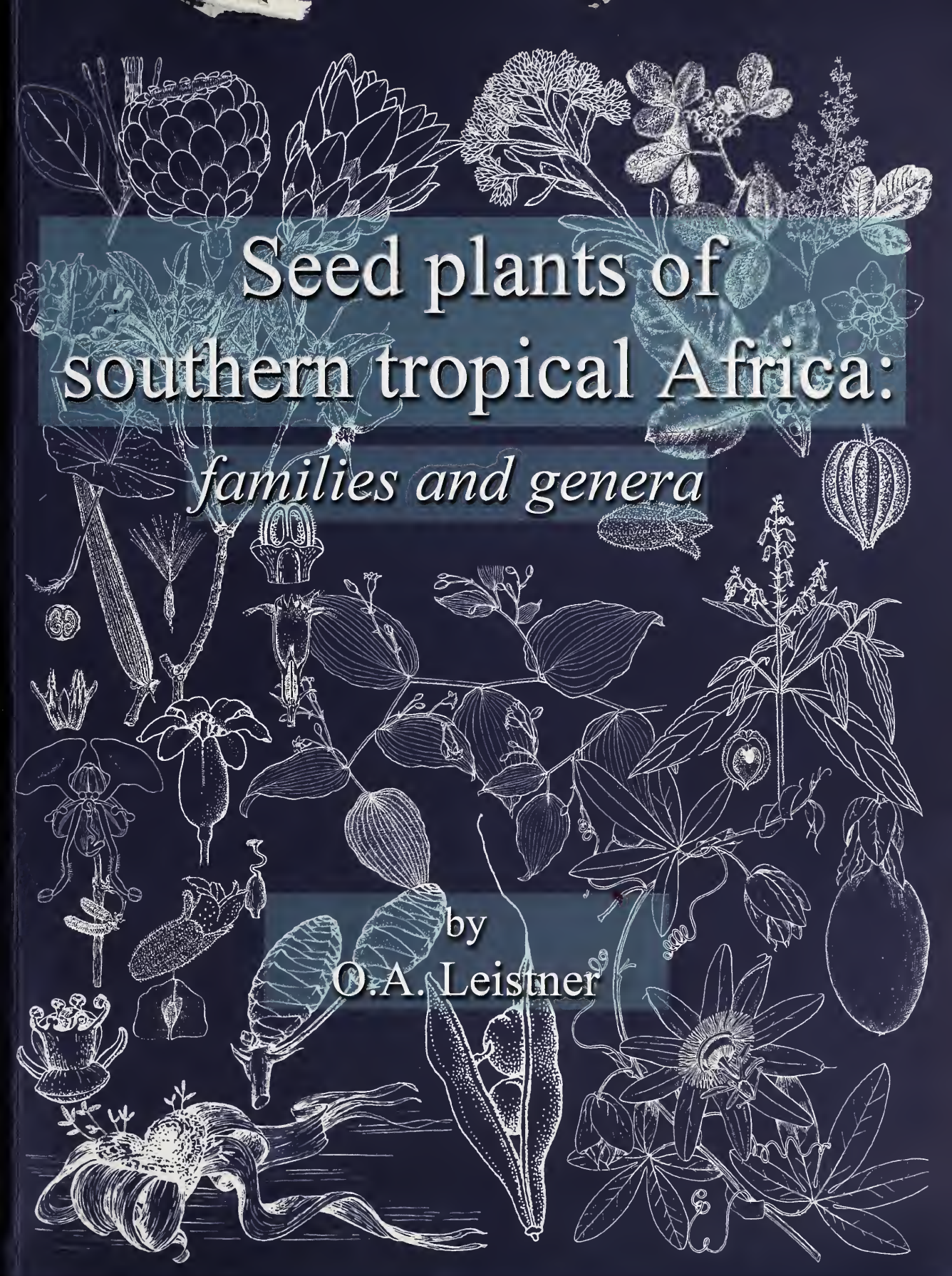

Seed plants of southern tropical Africa:

families and genera

by

O.A. Leistner

Southern African Botanical Diversity Network Report No. 26 ❖ 2005

Seed plants of southern tropical Africa: families and genera

Supplement to SEED PLANTS OF SOUTHERN AFRICA (Leistner 2000), covering Angola, Zambia, Zimbabwe, Malawi, and Mozambique

by

O.A. Leistner

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INTRODUCTION

After the publieation of *Seed plants of southern Africa: families and genera* (Leistner 2000) the Executive of SABONET expressed the wish to have the scope of this work extended to cover all 10 countries in which the organisation is active. In response to that wish the present project was undertaken. As indicated on the title page, it is a supplement to Leistner (2000) and it will generally be necessary to consult the two works together. During the compilation it was apparent how many plant groups are still poorly known. The present work should therefore be considered no more than a small tentative step towards that grand goal— a *Flora africana.*

Area covered

The area covered is referred to as *southern tropical Africa* (abbreviated: *sthn trop. Afr.*). Five countries are included: Angola, Zambia, Zimbabwe, Malawi, and Mozambique which lie in a broad belt from the Atlantic to the Indian Oceans to the north of the five countries in the southernmost part of Africa dealt with in Leistner (2000), namely Namibia, Botswana, South Africa, Swaziland and Lesotho.

Arrangement and circumscription of families and genera

As in Leistner (2000) the families are alphabetically arranged within the three groups: (1) **Gymnosperms** or non-angiosperm seed plants (pp. 26–29), (2) **Dicotyledons** or Magnoliopsida (pp. 30–374) and (3) **Monocotyledons** or Liliopsida (375–458). The Magnoliids, Ceratophyllales and the Basal families Cabombaceae and Nymphaeaceae are again treated within the alphabetical system of the dicotyledons.

Relationships between families are shown in the simplified cladograms taken from Angiosperm Phylogeny Group (APG II) (2003), on p. 3. The position of every family is also given in brackets underneath the family name in the text treatment: (1) in the first line according to the system of Cronquist (1988) as given in Mabberley (1997), which, in practice at least, has not yet quite replaced (2) the system of APG II, which is shown in the second line.

Compilation and main sources

This work was compiled almost exclusively from literature consulted up to October 2003. Information was freely copied, often verbatim, from the cited references. The main sources of information were Lebrun & Stork (1991–1997 and 2003), an unpublished checklist of families and genera of the region compiled by Dr Neil Brummitt and placed at my disposal by the author with kind permission of the Director of the Royal Botanic Gardens, Kew, *Kew Records* and the following Floras: *Flora zambesiaca*, *Conspectus florae angolensis, Flora de Moçambique*, *Flora of tropical east Africa*, *Flora of west tropical Africa*, *Flore d'Afrique centrale*, *Flore du Gabon* and *Flore du Cameroun.* The most frequently consulted journals were *Kew Bulletin* and *Bulletin du Jardin Botanique National de Belgique.*

Descriptions and notes

Descriptions of families and genera dealt with in Leistner (2000) are generally not repeated in this book. At the beginning of these families is a reference to that publication starting with the name of the compiler of the family account and giving the page on which it starts. Important family characters recorded for southern tropical Africa but not for southern Africa, are noted. The aim in compiling both family and genus descriptions was to reflect characters found in local representatives, rather than those found outside the region. Distribution and size of families and genera on a worldwide basis are given only for taxa not dealt with in Leistner (2000). Occurrence within the region is expressed in terms of the five countries covered. The presence of a genus in *southern Africa* is also generally recorded even though this fact is immediately visible by the absence of a description in the text. A genus recorded for both southern tropical and southern Africa with a single representative in *southern tropical Africa* is not necessarily represented in *southern Africa* by the same species. The number of genera in the region and the number of species by which they are represented is given.

Exotics

Full treatment is again given to genera represented by one or more exotic species considered to be growing spontaneously in natural vegetation and therefore likely to be taken as indigenous. Information on this issue is very sparse and there are likely to be many more naturalised exotics than listed here. Entirely exotic families, genera, and species are marked with an asterisk.

Synonyms

Synonyms cited are mainly those found in commonly used literature. Generic synonyms do not necessarily embrace the entire content of the current genus.

Identification of genera

Genera of families represented by only one genus will obviously key out in the key to families. In families with more than one genus there is either a key to genera, or notes describing how the genus can be keyed out using the key in Leistner (2000). In families in which all genera are also dealt with in Leistner (2000), no identification aids are given.

Number of taxa represented

The flora of the five countries, as reflected here, comprises 228 families, 2,032 genera, and 11,637 species. These figures are fairly similar to those for the five countries of *southern Africa* with regard to families and genera, but strikingly different with regard to species: 237 families, 2,242 genera, 20,677 species (Germishuizen & Meyer 2003). The vast difference in species numbers can be ascribed mainly to two factors: (1) the species-rich Cape Flora in *southern Africa*, and (2) the less complete knowledge of the flora of parts of the northern countries. The 18 largest genera in the Cape Flora are represented by 2,687 species (Goldblatt & Manning 2000). Of the same genera five are absent from *southern tropical Africa* and the rest comprise a mere 221 species. The 18 largest genera in *southern tropical Africa* contain a total of 1,993 species. The same genera are all well represented in *southern Africa* by a total of 1,444 species. Genera in *southern tropical Africa* are mostly smaller than in the region to the south, with an average of 5.7 species to the genus compared to 9.2.

Glossary

A glossary is given on p. 459.

Acknowledgements

My sincere thanks go to the Executive of SABONET, specifically Prof. Gideon Smith, and Mr Chris Willis and Dr Stefan Siebert for entrusting me with the task of compiling this work. It kept this pensioner out of mischief and out of the kitchen sink. The Chief Executive of the South African National Biodiversity Institute, Prof. Brian Huntley, is thanked for facilitating the contact with the Directorate of the Royal Botanic Gardens, Kew, which resulted in the assistance by researchers of that institution: Dr R.K. Brummitt, Dr Neil Brummitt, Dr Alan Paton and Dr Gerald Pope. The Publication Section of the SANBI again rendered sterling support; my particular thanks go to Emsie du Plessis, who helped me take the first faltering steps towards computer literacy; Sarie Brink and Daleen Maree provided technical support. Clare Archer of the SANBI (National Herbarium, Pretoria) gave me access to her draft checklist of Zambian Cyperaceae. Mariette, Elke, and Ninette provided the required congenial atmosphere at home base.

Literature

The literature consulted in the compilation of families is given at the end of each family treatment. The page on which a family is given in Leistner (2000) and the name of the compiler is shown at the beginning of all relevant families, but the work is not routinely listed under the References of the family. The work by Lebrun & Stork (1991–1997), which was very frequently consulted, is also not routinely cited. Literature referred to above, as well as much-used sources of a general nature, include the following:

ANGIOSPERM PHYLOGENY GROUP (2003). An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Botanical Journal of the Linnean Society* 141: 399–436.

BINGHAM, M.G. (Unpublished). Preliminary national checklist of Zambia (August 1999). Unpublished manuscript. SABONET, Pretoria.

BRUMMITT, N. (Unpublished). List of families and genera of the FZ region and Angola [without title]. Royal Botanic Gardens, Kew.

BRUMMITT, R.K. (compiler) 1992. *Vascular plant families and genera*. Royal Botanic Gardens, Kew.

BRUMMITT, R.K. & POWELL, C.E. (eds) 1992. *Authors of plant names*. Royal Botanic Gardens, Kew.

COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.

CRONQUIST, A. 1988. *The evolution and classification of flowering plants*, edn 2. New York Botanical Garden, Bronx, New York.

GOSSWEILER, J. & MENDONÇA, F.A. 1939. *Carta fitogeográfica de Angola*. Govêrno Geral de Angola.

EXELL, A.W., GOOD, R.D'O., GREVES, S. & MOORE, S. 1929–1936. Mr. Gossweiler's Portuguese West African plants. *Journal of Botany* 64–74. Supplements: Polypetalae and Gamopetalae.

GERMISHUIZEN, G. & MEYER, N.L. (eds) 2003. Plants of southern Africa: an annotated checklist. *Strelitzia* 14. National Botanical Institute, Pretoria.

GOLDBLATT, P. & MANNING, J. 2000. *Cape plants. A conspectus of the Cape Flora of South Africa*. National Botanical Institute of South Africa and MBG Press, Missouri Botanical Garden, St. Louis, Missouri, U.S.A.

GREUTER, W., BRUMMITT, R.K., FARR, E., KILIAN, N., KIRK, P.M & SILVA, P.C. 1993. *NCU-3, Names in current use for extant plant genera*. Koeltz Scientific Books. Königstein, Germany.

HIERN, W.P. 1896–1900. *Catalogue of the African plants collected by Dr. Friedrich Welwitsch in 1853–61*. Trustees of the British Museum (Natural History), London.

LAWRENCE, G.H.M., BUCHHEIM, A.F.G, DANIELS, G.S. & DOLEZAL, H. 1968. *B-P-H. Botanico-Periodicum-Huntianum*. Hunt Botanical Library, Pittsburgh, Pa.

LEBRUN, J.-P. & STORK, A.L. 1991–1997. *Énumeration des plantes à fleurs d'Afrique tropicale* 1–4. Conservatoire et Jardin botaniques de la Ville de Genève.

LEBRUN, J.-P. & STORK, A.L. 2003. *Tropical African flowering plants. Ecology and distribution*. Volume 1: Annonaceae–Balanitaceae. Éditions des Conservatoire et Jardin botaniques de la Ville de Genève.

LEISTNER, O.A. (ed.) 2000. Seed plants of southern Africa: families and genera. *Strelitzia* 10. National Botanical Institute, Pretoria.

MABBERLEY, D.J. 1997. *The plant-book*. Cambridge University Press, Cambridge.

MAPAURA, A. (Unpublished). Checklist of the vascular plants of Zimbabwe. Unpublished manuscript. SABONET, Pretoria.

PHIRI, P.S.M. (Unpublished). Checklist of Zambian vascular plants. Unpublished manuscript. SABONET, Pretoria.

RENDLE, A.B. 1899. *Catalogue of the African plants collected by Dr. Friedrich Welwitsch in 1853–61*. Trustees of the British Museum (Natural History), London.

STAFLEU, F.A. & COWAN, R.S. 1976–1988. *Taxonomic literature* 1–7, edn 2. Bohn, Scheltema & Holkema, Utrecht/Junk, The Hague.

TAKHTAJAN, A. 1997. *Diversity and classification of flowering plants*. Columbia University Press, New York.

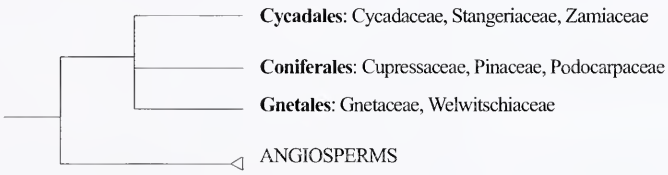
WHITE, F. 1962. *Forest flora of Northern Rhodesia*. Oxford University Press, Oxford.

WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.

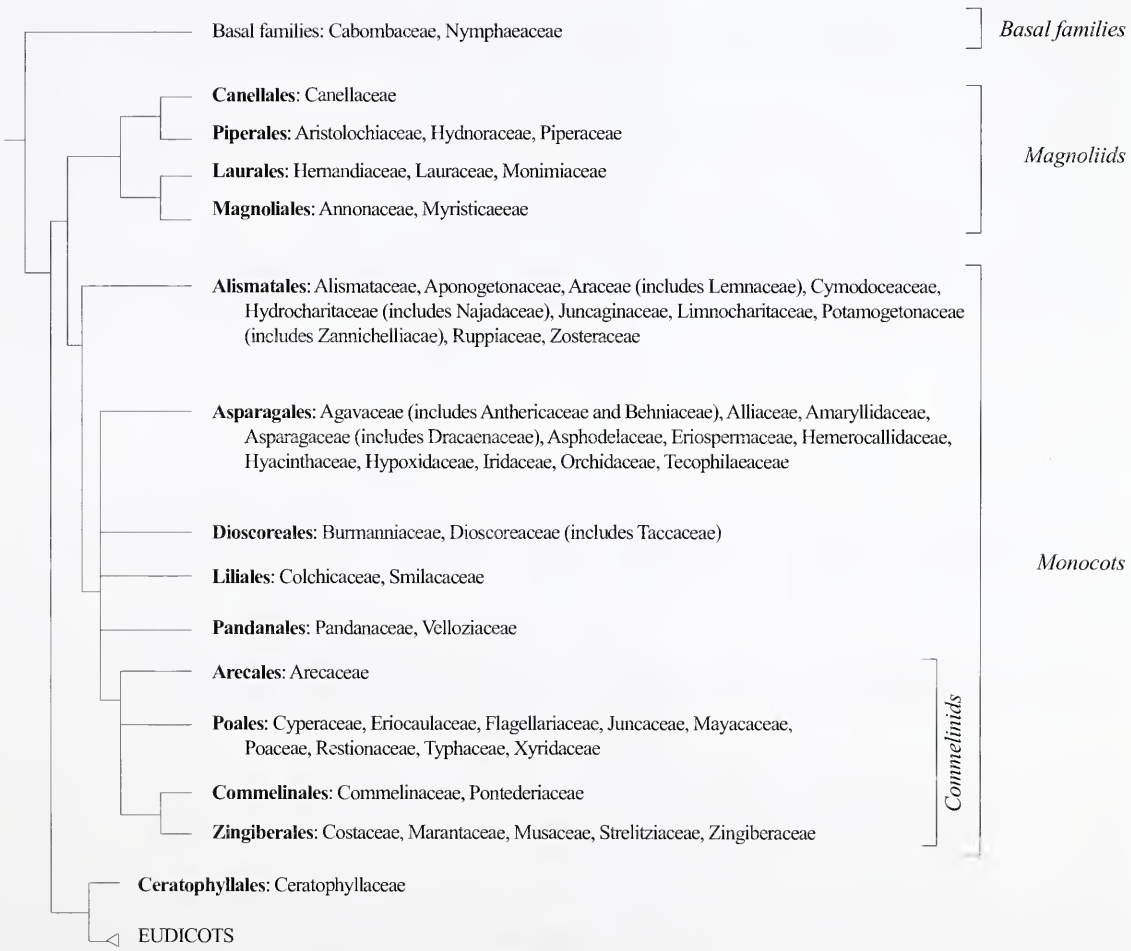
CLASSIFICATION OF FAMILIES

In this work, families are arranged alphabetically under (1) gymnosperms, (2) dicotyledons, and (3) monocotyledons. The relationships between families are therefore scarcely reflected by their position. A knowledge of the phylogenetic situation of a family, however, is essential if it is to be seen in a wider context. In the simplified cladograms below, families are arranged according to the system proposed by the Angiosperm Phylogeny Group II (2002, *Botanical Journal of the Linnean Society* 141: 399–436). Only families recorded from southern tropical Africa are included. The order to which each family is assigned is also given in the Index (p.479). Unplaced families are listed after the asterids (p.4). Exotic families are not marked with an asterisk.

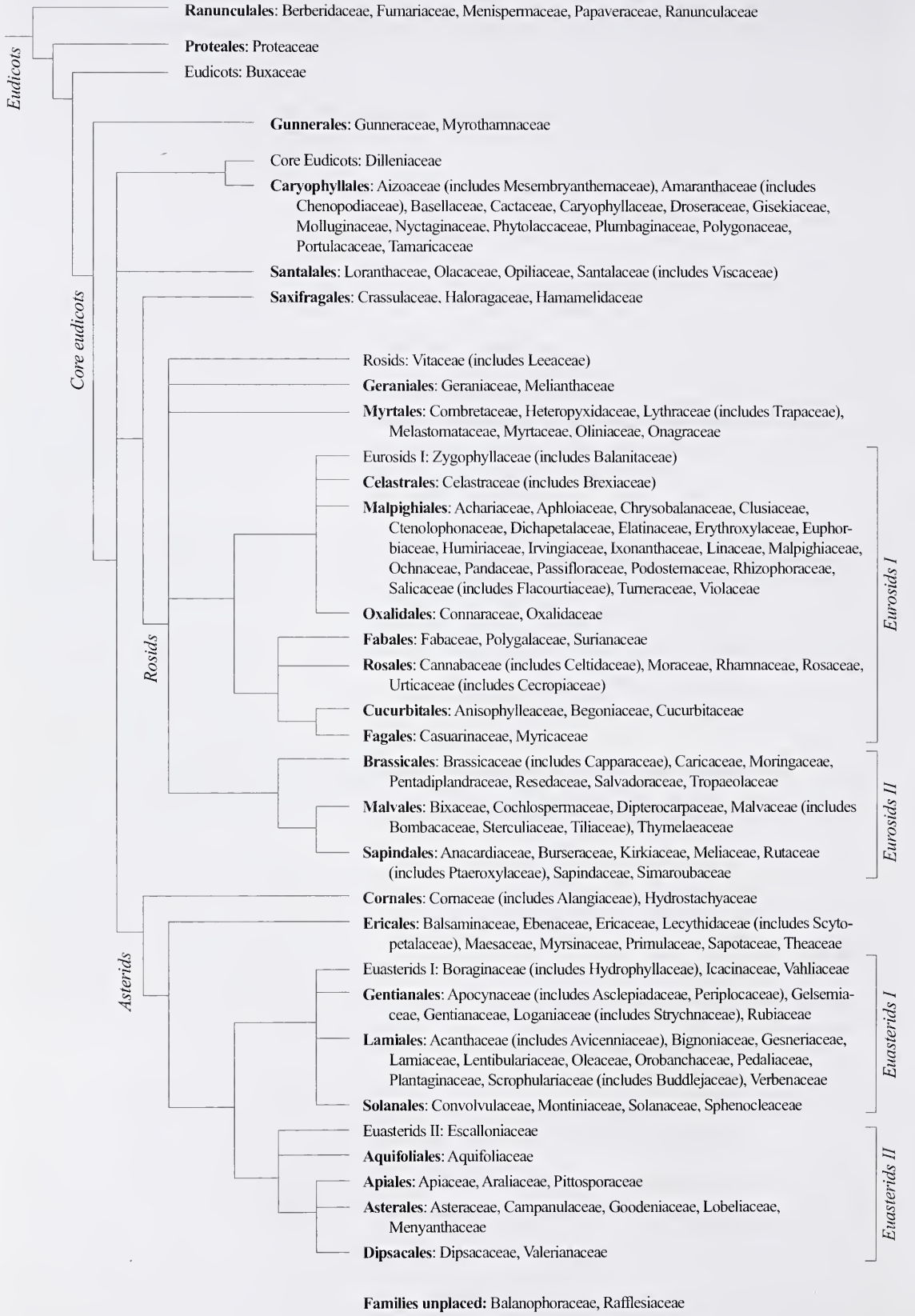
GYMNOSPERMS



ANGIOSPERMS


Basal families: Cabombaceae, Nymphaeaceae
Basal families
Canellales: Canellaceae
Piperales: Aristolochiaceae, Hydnoraceae, Piperaceae
Laurales: Hernandiaceae, Lauraceae, Monimiaceae
Magnoliales: Annonaceae, Myristicaeeae
Magnoliids
Alismatales: Alismataceae, Aponogetonaceae, Araceae (includes Lemnaceae), Cymodoceaceae, Hydrocharitaceae (includes Najadaceae), Juncaginaceae, Limnocharitaceae, Potamogetonaceae (includes Zannichelliacae), Ruppiaceae, Zosteraceae
Asparagales: Agavaceae (includes Anthericaceae and Behniaceae), Alliaceae, Amaryllidaceae, Asparagaceae (includes Dracaenaceae), Asphodelaceae, Eriospermaceae, Hemerocallidaceae, Hyacinthaceae, Hypoxidaceae, Iridaceae, Orchidaceae, Tecophilaeaceae
Dioscoreales: Burmanniaceae, Dioscoreaceae (includes Taccaceae)
Liliales: Colchicaceae, Smilacaceae
Pandanales: Pandanaceae, Velloziaceae
Arecales: Arecaceae
Poales: Cyperaceae, Eriocaulaceae, Flagellariaceae, Juncaceae, Mayacaceae, Poaceae, Restionaceae, Typhaceae, Xyridaceae
Commelinales: Commelinaceae, Pontederiaceae
Zingiberales: Costaceae, Marantaceae, Musaceae, Strelitziaceae, Zingiberaceae
Commelinids
Monocots
Ceratophyllales: Ceratophyllaceae
EUDICOTS

EUDICOTS


Eudicots
Core eudicots
Rosids
Asterids
Eurosids I
Eurosids II
Euasterids I
Euasterids II
Ranunculales: Berberidaceae, Fumariaceae, Menispermaceae, Papaveraceae, Ranunculaceae
Proteales: Proteaceae
Eudicots: Buxaceae
Gunnerales: Gunneraceae, Myrothamnaceae
Core Eudicots: Dilleniaceae
Caryophyllales: Aizoaceae (includes Mesembryanthemaceae), Amaranthaceae (includes Chenopodiaceae), Basellaceae, Cactaceae, Caryophyllaceae, Droseraceae, Gisekiaceae, Molluginaceae, Nyctaginaceae, Phytolaccaceae, Plumbaginaceae, Polygonaceae, Portulacaceae, Tamaricaceae
Santalales: Loranthaceae, Olacaceae, Opiliaceae, Santalaceae (includes Viscaceae)
Saxifragales: Crassulaceae, Haloragaceae, Hamamelidaceae
Rosids: Vitaceae (includes Leeaceae)
Geraniales: Geraniaceae, Melianthaceae
Myrtales: Combretaceae, Heteropyxidaceae, Lythraceae (includes Trapaceae), Melastomataceae, Myrtaceae, Oliniaceae, Onagraceae
Eurosids I: Zygophyllaceae (includes Balanitaceae)
Celastrales: Celastraceae (includes Brexiaceae)
Malpighiales: Achariaceae, Aphloiaceae, Chrysobalanaceae, Clusiaceae, Ctenolophonaceae, Dichapetalaceae, Elatinaceae, Erythroxylaceae, Euphorbiaceae, Humiriaceae, Irvingiaceae, Ixonanthaceae, Linaceae, Malpighiaceae, Ochnaceae, Pandaceae, Passifloraceae, Podostemaceae, Rhizophoraceae, Salicaceae (includes Flacourtiaceae), Turneraceae, Violaceae
Oxalidales: Connaraceae, Oxalidaceae
Fabales: Fabaceae, Polygalaceae, Surianaceae
Rosales: Cannabaceae (includes Celtidaceae), Moraceae, Rhamnaceae, Rosaceae, Urticaceae (includes Cecropiaceae)
Cucurbitales: Anisophylleaceae, Begoniaceae, Cucurbitaceae
Fagales: Casuarinaceae, Myricaceae
Brassicales: Brassicaceae (includes Capparaceae), Caricaceae, Moringaceae, Pentadiplandraceae, Resedaceae, Salvadoraceae, Tropaeolaceae
Malvales: Bixaceae, Cochlospermaceae, Dipterocarpaceae, Malvaceae (includes Bombacaceae, Sterculiaceae, Tiliaceae), Thymelaeaceae
Sapindales: Anacardiaceae, Burseraceae, Kirkiaceae, Meliaceae, Rutaceae (includes Ptaeroxylaceae), Sapindaceae, Simaroubaceae
Cornales: Cornaceae (includes Alangiaceae), Hydrostachyaceae
Ericales: Balsaminaceae, Ebenaceae, Ericaceae, Lecythidaceae (includes Scytopetalaceae), Maesaceae, Myrsinaceae, Primulaceae, Sapotaceae, Theaceae
Euasterids I: Boraginaceae (includes Hydrophyllaceae), Icacinaceae, Vahliaceae
Gentianales: Apocynaceae (includes Asclepiadaceae, Periplocaceae), Gelsemiaceae, Gentianaceae, Loganiaceae (includes Strychnaceae), Rubiaceae
Lamiales: Acanthaceae (includes Avicenniaceae), Bignoniaceae, Gesneriaceae, Lamiaceae, Lentibulariaceae, Oleaceae, Orobanchaceae, Pedaliaceae, Plantaginaceae, Scrophulariaceae (includes Buddlejaceae), Verbenaceae
Solanales: Convolvulaceae, Montiniaceae, Solanaceae, Sphenocleaceae
Euasterids II: Escalloniaceae
Aquifoliales: Aquifoliaceae
Apiales: Apiaceae, Araliaceae, Pittosporaceae
Asterales: Asteraceae, Campanulaceae, Goodeniaceae, Lobeliaceae, Menyanthaceae
Dipsacales: Dipsacaceae, Valerianaceae
Families unplaced: Balanophoraceae, Rafflesiaceae

IDENTIFICATION OF FAMILIES

This supplement, used in conjunction with *Seedplants of southern Africa: families and genera* (Leistner 2000), aims to help the reader identify seed plants from *southern tropical Africa* down to genus level and, in the case of genera represented only by one species, down to species level. The key to families, given later in this section, covers all families dealt with. Descriptions of families and genera given in Leistner (2000) are not repeated and only important family characters not occurring in plants from southern Africa are listed. Keys to genera are provided or, in some families, with only a few genera additional to those in the original work, notes are provided to indicate where the genus would run in the key in Leistner (2000).

Characteristics found only in a limited number of families

Certain distinctive attributes encountered in some or all members of a limited number of families may prove helpful when identifying plants (G—gymnosperms; M—monocotyledons; all others—dicotyledons):

Water plants, free-floating or with floating leaves:
Alismataceae (M), Aponogetonaceae (M), Araceae (including Lemnaceae) (M), Cabombaceae, Crassulaceae, Droseraceae, Hydrocharitaceae (M), Lentibulariaceae, Limnocharitaceae (M), Lythraceae, Mayacaceae (M), Menyanthaceae, Nymphaeaceae, Onagraceae, Podostemaceae, Pontederiaceae (M), Potamogetonaceae (M), Scrophulariaceae, Trapaceae.

Water plants, with submerged stems and leaves:
Alismataceae (M), Aponogetonaeeae (M), Ceratophyllaceae, Cymodoceaceae (M), Droseraceae, Elatinaceae, Haloragaceae, Hydrocharitaceae (M), Hydrostachyaceae, Lentibulariaceae, Limnocharitaceae (M), Lythraceae, Mayacaceae (M), Najadaceae (M), Onagraceae, Podostemaceae, Potamogetonaceae (M), Ranunculaceae, Ruppiaceae (M), Scrophulariaceae, Zannichelliaceae (M), Zosteraceae (M).

Parasitic plants:
(1) Without chlorophyll: Balanophoraceae, Convolvulaceae, Hydnoraceae, Lauraeeae, Rafflesiaceae, Scrophulariaceae (including Orobanchaeeae); (2) growing on aerial parts of trees and shrubs: Loranthaceae, Viscaceae.

Grasses and grass-like plants:
Cyperaceae (M), Juncaceae (M), Poaceae (M), Restionaceae (M), Typhaceae (M).

Succulent plants:
*Agavaceae (M), Aizoaceae, Amaranthaceae, Amaryllidaceae (M), Apocynaceae, Asphodelaceae (M), Asteraceae, Balsaminaceae, Begoniaceae, Boraginaceae (*Heliotropium curassavicum*), Cactaceae, Chenopodiaceae, Crassulaceae, Dracaenaceae (M), Euphorbiaceae, Geraniaceae, Goodeniaceae, Hyacinthaceae (M), Hydnoraceae, Lamiaceae, Loranthaceae, Menispermaceae, Mesembryanthemaceae, Molluginaceae, Orchidaceae (M), Passifloraceae, Pedaliaceae, Phytolaccaceae, Piperaceae, Polygonaceae, Portulacaceae, Rafflesiaceae, Rubiaceae (*Phylohydrax*), Scrophulariaceae, Viscaceae, Vitaceae, Zygophyllaceae.

Plants with true bulbs:
Alliaceae (M), Amaryllidaceae (M), Hyacinthaceae (M).

Plants with milky or coloured to conspicuous watery sap:
Alismataceae (M), Apocynaceae, Araceae (M), Asteraceae, *Bixaceae, Burseraceae, Cabombaceae, Campanulaceae, Caricaceae, Cecropiaceae, Cochlospermaceae, Convolvulaceae (some spp. of *Ipomoea*), Euphorbiaceae, *Fumariaeeae, Humiriaceae, Limnocharitaceae (M), Lobeliaceae, Moraceae, Moringaceae, Myristicaceae, Nymphaeaceae, *Papaveraceae, Sapotaceae.

Stem twining:
Annonaceae, Apocynaceae, Aristolochiaceae, Basellaceae, Behniaceae (=Luzuriagaceae) (M), Connaraceae, Convolvulaceae, Dioscoreaceae (M), Euphorbiaceae, Fabaceae, Flagellariaceae (M), Gnetaceae (G), Hyacinthaceae (M), Lauraceae, Linaceae, Malpighiaceae, Menispermaceae, Oleaceae, Polygonaceae, Solanaceae.

Tendrils present:
Apocynaceae, Bignoniaceae, Colchicaceae (M), Cucurbitaceae, Fabaceae, Flagellariaceae (M), *Fumariaceae, Linaceae, Menispermaceae, Passifloraceae, Rhamnaceae, Sapindaceae, Smilacaceae (M), Vitaceae.

Leaves absent or reduced to scales:
Amaranthaceae, Apocynaceae, Araceae (including Lemnaceae) (M); Asparagaceae (M), Asteraceae, Burmanniaceae (M), Cactaceae, Campanulaceae, *Casuarinaceae, Chenopodiaceae, Convolvulaceae, Cucurbitaceae, Cupressaceae (G), Euphorbiaceae, Geraniaceae, Hyacinthaceae (M), Hydnoraceae, Juncaceae (M), Lauraceae, Mesembryanthemaceae, Orchidaceae (M), Podostemaceae, Rafflesiaceae,

Restionaceae (M), Santalaceae, Scrophulariaceae (including Orobanchaceae), Viscaceae, Zannichelliaceae (M).

Leaves digitately compound (3 to many leaflets):
Anacardiaceae, Apiaceae, Araliaceae, Araceae (M), Arecaceae (M), Bignoniaceae, Burseraceae, *Cannabaceae, Capparaceae, Ceratophyllaceae, Cucurbitaceae, Dioscoreaceae (M), Droseraceae, Euphorbiaceae, Fabaceae, *Fumariaceae, Geraniaceae, Lamiaceae, Lentibulariaceae, Malvaceae (in broad sense), Oleaceae, Oxalidaceae, Passifloraceae, Pedaliaceae, Ranunculaceae, Rosaceae, Rutaceae, Sapindaceae, Verbenaceae, Vitaceae, Zygophyllaceae.

Leaves paripinnate:
Araliaceae, Balanitaceae, Cycadaceae (G), Fabaceae (especially Caesalpinioideae), Hydrostachyaceae, Meliaceae, Oxalidaceae, Ptaeroxylaceae, Sapindaceae, Stangeriaceae (G), Zamiaceae (G), Zygophyllaceae.

Leaves imparipinnate:
Anacardiaceae, Apiaceae, Araceae (M), Arecaceae (M), Asteraceae, Bignoniaceae, Brassicaceae, Burseraceae, Connaraceae, Fabaceae, *Fumariaceae, Geraniaceae, Haloragaceae, Hydrostachyaceae, Kirkiaceae, Leeaceae, Meliaceae, Melianthaceae, Moringaceae, Oleaceae, Proteaceae, Ranunculaceae, Resedaceae, Rosaceae, Rutaceae, Sapindaceae, Simaroubaceae, Stangeriaceae (G), Valerianaceae, Zamiaceae (G), Zygophyllaceae.

Leaves 2x or 3x pinnate:
Apiaceae, Araliaceae, Araceae (M), Asteraceae, Bignoniaceae, Fabaceae, *Fumariaceae, Geraniaceae, Hydrostachyaceae, Leeaceae, Lentibulariaceae, Meliaceae, Moringaceae, Proteaceae, Ranunculaceae.

Flowers densely crowded, sessile, usually small to minute; in heads, or on a fleshy axis surrounded by a conspicuous bract, or enclosed as in a fig; inflorescence often resembling a single flower:
Amaranthaceae, Apiaceae, Araceae (M), Araliaceae, Asteraceae, Balanophoraceae, *Casuarinaceae, Colchicaceae (M), Convolvulaceae, Dipsacaceae, Eriocaulaceae (M), Euphorbiaceae (*Euphorbia*), Fabaceae (Mimosoideae), Gentianaceae, Hamamelidaceae, Hyacinthaceae (M), Juncaceae (M), Moraceae, Pandanaceae (M), Portulacaceae, Proteaceae, Rhamnaceae (*Phylica*), Rubiaceae, Thymelaeaceae, Urticaceae, Verbenaceae, Xyridaceae (M).

Flowers in an umbel or pseudo-umbel:
Alismataceae (M), Alliaceae (M), Amaryllidaceae (M), Anthericaceae (M), Apiaceae, Apocynaceae, Araliaceae, Brexiaceae, Capparaceae, Cyperaceae (M), Euphorbiaceae, Fabaceae, Geraniaceae, Gisekiaceae, Hydrocharitaceae (M), Iridaceae (M), Leeaceae, Limnocharitaceae (M), Loranthaceae, Malpighiaceae, Menyanthaceae, Molluginaceae, Myrsinaceae, Myrtaceae, Nyctaginaceae, Oxalidaceae, Ranunculaceae, Rhamnaceae, Ruppiaceae (M), Rutaceae, Smilacaceae (M), Solanaceae, Taccaceae (M), Thymelaeaceae, Viscaceae.

Perianth absent:
Amaranthaceae, Araceae (including Lemnaceae) (M), Asteraceae, Balanophoraceae, Begoniaceae, *Casuarinaceae, Chenopodiaceae, Cupressaceae (G), Cymodoceaceae (M), Cyperaceae (M), Euphorbiaceae, Fabaceae (*Brachystegia*), Gunneraceae, Haloragaceae, Hydrostachyaceae, Moraceae, Myricaceae, Myrothamnaceae, Najadaceae (M), Pandanaceae (M), Pinaceae (G), Piperaceae, Poaceae (M), Podostemaceae, Podocarpaceae (G), Potamogetonaceae (M), Restionaceae (M), Ruppiaceae (M), Salicaceae, Stangeriaceae (G), Typhaceae (M), Viscaceae, Zamiaceae (G), Zannichelliaceae (M), Zosteraceae (M).

Perianth dry, pergamentaceous:
Amaranthaceae, *Cannabaceae, *Casuarinaceae, Cyperaceae (M), Eriocaulaceae (M), Juncaceae (M), Moraceae, Plantaginaceae, Poaceae (M), Restionaceae (M), Typhaceae (M), Xyridaceae (M).

Perianth spurred:
Balsaminaceae, Brassicaceae, Lentibulariaceae, Orchidaceae (M), Pedaliaceae, Scrophulariaceae, Tropaeolaceae, Valerianaceae, Violaceae.

Sex organs, at least of one sex, in cones or catkins:
*Casuarinaceae, Costaceae (M), Cupressaceae (G), Cycadaceae (G), Euphorbiaceae, Gunneraceae, Moraceae, Myricaceae, Myrothamnaceae, Pandanaceae (M), *Pinaceae (G), Podocarpaceae (G), Salicaceae, Stangeriaceae (G), Welwitschiaceae (G), Zamiaceae (G).

Anthers connate:
Apocynaceae, Araceae (M), Asteraceae, Balsaminaceae, Cucurbitaceae, *Fumariaceae, Hydnoraceae, Campanulaceae (including Lobeliaceae), Rafflesiaceae, Scrophulariaceae, Violaceae.

Gynoecium of 2 or more free carpels with separate styles:
Alismataceae (M), Annonaceae, Aponogetonaceae (M), Arecaceae (M), Cabombaceae, Connaraceae, Crassulaceae, Cymodoceaceae (M), Gisekiaceae, Juncaginaceae (M), Limnocharitaceae (M), Menispermaceae, Nymphaeaceae,

Phytolaccaceae, Potamogetonaceae (M), Ranunculaceae, Rosaceae, Ruppiaceae (M), Zannichelliaceae (M).

Fruit a circumscissile capsule: opening by a lid:
Aizoaceae, Convolvulaceae (*Operculina*), Hypoxidaceae (M), Lentibulariaceae, Lythraceae, Plantaginaceae, Plumbaginaceae, Portulacaceae, Primulaceae, Rubiaceae (*Mitracarpus*), Sphaenocleaceae.

Keys to families

KEY TO MAJOR GROUPS

1a Flowers absent; ovules/seeds borne on scales arranged in cones, or exposed, not in an ovary; pollen sacs borne on scales arranged in cones; trees to woody perennials; leaves mostly either linear to narrowly ovate or needle-, scale- or palm-like ..... **GYMNOSPERMS** (key below)
1b Flowers present; ovules/seeds enclosed in an ovary; pollen borne in anthers; annual herbs to trees (**ANGIOSPERMS**):
2a Leaves usually net-veined, simple to variously compound, often with a petiole, base rarely sheathing the stem (e. g. Apiaceae, Ranunculaceae); stipules present or absent; flower parts usually in 4s or 5s; vascular bundles in stem usually arranged in a cylinder; embryo usually with 2 cotyledons ..... **DICOTYLEDONS** (key below)
2b Leaves usually with parallel-convergent veins, simple or rarely compound or lobed but then leaflets or lobes with parallel, not net-like venation, leaves rarely with a petiole but base usually sheathing the stem at least partly; stipules absent; flower parts usually in 3s; vascular bundles scattered in stem; embryo with 1 cotyledon ..... **MONOCOTYLEDONS** (key on p. 23)

KEY TO GYMNOSPERMS (pp. 26–29)

1a Leaves 2, opposite, permanent, sprawling on the ground and often torn lengthwise by the wind ..... **WELWITSCHIACEAE**
1b Leaves indefinite in number, produced in succession from apex of stems:
2a Palm- or fern-like plants with fibrous stems or trunks, or stemless with a tuberous rootstock:
3a Stemless, somewhat fern-like plants with a tuberous rootstock; leaves deciduous from their base; leaflets with midrib and dichotomously branched lateral veins ..... **STANGERIACEAE**
3b Stems above and often below ground, covered with persistent leaf bases, sometimes up to 10 m tall, with a crown of palm-like leaves:
4a Leaflets with thick midrib and no lateral veins; (2–)4–10 pairs of ovules borne on the margins of the up to 0.3 m long female fronds spirally arranged in a dense whorl at apex of stem ..... **CYCADACEAE**
4b Leaflets with longitudinal parallel venation and no midrib; 2 ovules are borne on the adaxial (upper) side of stalked scales tightly packed in large cylindric to ovoid cones borne at or near the apex of the stem ..... **ZAMIACEAE**
2b Trees or shrubs with hardwood stems, or remotely branched lianes; leaves simple:
5a Remotely branched lianes with decussate leaves ..... **GNETACEAE**
5b Trees or shrubs with hardwood stems; leaves spirally arranged, whorled or decussate:
6a Leaves small and scale-like; ovules/seeds borne between scales of a rounded woody, rarely fleshy cone ..... **CUPRESSACEAE**
6b Leaves well-developed, linear to narrowly ovate or needle-like:
7a Dioecious trees or shrubs; leaves linear to narrowly ovate; ovules/seeds 1 or 2 borne on a receptacle (often swollen and fleshy), not in cones ..... **PODOCARPACEAE**
7b Monoecious trees or shrubs; leaves mostly needle-like, 1 or few united at base by a membranous sheath; female cones with many spirally arranged scales, leathery or fleshy at first, mostly becoming stiff and woody later, each scale bearing 2 ovules/seeds ..... ***PINACEAE**

KEY TO DICOTYLEDONS (pp. 30–374)

1a Gynoecium composed of 2 or more **free carpels** with separate styles and stigmas (in Nymphaeaceae the carpels are sunk in a fleshy disc):
2a Petals absent; perianth members all ± similar ..... **Group 1** (p. 8)
2b Petals present ..... **Group 2** (p. 8)
1b Gynoecium composed of **1 carpel** or of 2 or more ± **united carpels** with united or free styles, or if carpels free below then styles or stigmas united:
3a **Placentation parietal or marginal**: ovules 2 or more in the ovary, borne on its outer wall or sometimes on intrusions thereof:
4a Ovary superior:
5a Petals absent; perianth members, if present, all ± similar ..... **Group 3** (p. 8)
5b Petals free ..... **Group 4** (p. 9)
5c Petals ± united ..... **Group 5** (p. 10)
4b Ovary ± inferior ..... **Group 6** (p. 11)
3b **Placentation axile, basal or apical**: 1 or more ovules in the ovary, borne on the central axis, or the base or apex of the ovary, or placentation indistinct:
6a Ovary superior:
7a Petals absent; perianth members, if present, all ± similar ..... **Group 7** (p. 11)
7b Petals free ..... **Group 8** (p. 14)
7c Petals ± united ..... **Group 9** (p. 18)
6b Ovary inferior:
8a Petals absent; perianth members, if present, all ± similar ..... **Group 10** (p. 20)
8b Petals free ..... **Group 11** (p. 21)
8c Petals ± united ..... **Group 12** (p. 22)

GROUP 1 (*Carpels free; petals absent*)

1a Stamens perigynous, arising at mouth of calyx tube; sepals united below, imbricate; leaves pinnate or digitate or palmately lobed; stipules present; trees, shrubs or herbs, sometimes scrambling and with prickles ..... **ROSACEAE**

1b Stamens hypogynous; sepals free or if united near base then valvate and stamens united into a column:

2a Stamens united into a column ..... STERCULIOIDEAE—**MALVACEAE**

2b Stamens free:

3a Leaves compound, sometimes decompound; sepals petaloid; herbs or soft-wooded climbing or trailing plants ..... **RANUNCULACEAE**

3b Leaves simple:

4a Flowers unisexual; plants dioecious; woody climbers with alternate leaves:

5a Sepals 6–18 in 2 or more whorls; stamens 3–6, free or united into a synandrium; flowers in cymes or racemes; leaves entire or palmately lobed ..... **MENISPERMACEAE**

5b Sepals 4 or 5 in 1 whorl; stamens 10–15, free; flowers in elongated racemes; leaves entire ..... **PHYTOLACCACEAE**

4b Flowers bisexual; herbs with opposite or subopposite leaves:

6a Leaves entire; calyx herbaceous; flowers small, in cymes or panicles ..... **GISEKIACEAE**

6b Leaves toothed or lobed; calyx petaloid; flowers large and conspicuous, solitary or few together ..... **RANUNCULACEAE**

GROUP 2 (*Carpels free but sometimes pressed together; petals present*)

1a Leaves opposite; stipules absent; carpels as many as petals; plants often succulent ..... **CRASSULACEAE**

1b Leaves alternate, sometimes all radical:

2a Aquatic herbs with floating leaves on long petioles; leaf blades ± peltate; flowers solitary, on long scapes, often large and conspicuous:

3a Carpels sunk in a fleshy disc; petals many; leaf blades cordate as well as peltate ..... **NYMPHAEACEAE**

3b Carpels not sunk in a fleshy disc; petals 3; leaf blades peltate, not cordate ..... **CABOMBACEAE**

2b Terrestrial plants; leaf blades not peltate:

4a Stamens perigynous, arising at mouth of calyx tube; leaves pinnate or digitate; stipules present; trees, shrubs or herbs, sometimes scrambling with prickles ..... **ROSACEAE**

4b Stamens hypogynous, not arising on calyx:

5a Sepals 6–24 in 2 or more whorls, free or inner ones united; dioecious shrublets or woody climbers with small flowers ..... **MENISPERMACEAE**

5b Sepals 2–5 in 1 whorl, free or united:

6a Leaves compound or deeply divided:

7a Herbs ..... **RANUNCULACEAE**

7b Trees or shrubs ..... **CONNARACEAE**

6b Leaves simple, entire:

8a Leaves succulent; a nectary gland present at base of each carpel; stamens 8–12 ..... **CRASSULACEAE**

8b Leaves herbaceous; without a nectary at base of each carpel; stamens mostly more than 12, if 5 + 5 then grey-green maritime shrubs:

9a Herbs ..... **RANUNCULACEAE**

9b Trees or shrubs, sometimes trailing:

10a Leaves palmatinerved ..... BROWNLOWIOIDEAE (*Christiana*)—**MALVACEAE**

10b Leaves penninerved or venation ± invisible:

11a Sepals 2 or 3, valvate, free or united; anthers often longer than filaments, often with a broad prolongation of the connective above the thecae; flowers solitary or fasciculate or in few-flowered cymes ..... **ANNONACEAE**

11b Sepals 5, imbricate, free; anthers much shorter than filaments, and anther connective without prolongation:

12a Stamens many; ovules few to many per carpel ..... **DILLENIACEAE**

12b Stamens 10 in whorls of 5; ovules 2 per carpel ..... **SURIANACEAE**

GROUP 3 (*Placentation parietal; ovary superior; petals absent*)

1a Submerged aquatic herbs, fern-like owing to pinnately much-divided leaves; plants dioecious; flowers in elongated, pedunculate spikes; calyx absent ..... **HYDROSTACHYACEAE**

1b Terrestrial plants, not fern-like in habit:

2a Leaves pinnate or 2-foliolate; trees ..... **FABACEAE**

2b Leaves simple or digitately 3-foliolate, sometimes reduced to scales:

3a Flowers unisexual; plants dioecious or monoecious; leaves simple, often with salicoid dentation; flowers usually with a disc or separate disc glands; trees or shrubs ..... **SALICACEAE**

3b Flowers bisexual; leaves simple or variously divided, if dentate then dentition not salicoid; disc and corona absent or present; plants herbaceous or woody:

4a Flowers with a fimbriate corona outside stamens; herbs or shrubs, often climbing with tendrils ..... **PASSIFLORACEAE**

4b Flowers without corona; tendrils absent:

5a Herbs or low shrublets; fruit a small capsule, either 1-locular with many ovules or 2-locular with 1 or 2 ovules per locule:

6a Capsule (silicula) with 2 1- or 2-seeded locules divided by a persistent, often membranous partition ..... **BRASSICACEAE**

6b Capsule 1-locular, often open at the top, with many ovules on 2–5 placentas ..... **RESEDACEAE**

5b Shrubs or trees; fruit, if a capsule, with more than 2 seeds per locule:

7a Ovary borne on a distinct stalk (gynophore) ..... **CAPPARACEAE**

7b Ovary sessile or subsessile:

8a Ovary with a single parietal placenta; style 1, short; stigma peltate; disc absent ..... **APHLOIACEAE**
8b Ovary with 2 or more parietal placentas; styles 1–8, entire or branched; disc or disc glands usually present ..... **SALICACEAE**

GROUP 4 (*Placentation parietal; ovary superior; petals free*)

1a Stamens 6, tetradynamous (inner 4 long, outer 2 short); sepals 4; petals 4 or fewer; leaves without stipules; herbs ..... **BRASSICACEAE**
1b Stamens not tetradynamous:
2a Gynoecium composed of 1 carpel, thus with only 1 placenta in the ovary:
3a Flowers regular; petals 5 or fewer, sometimes 1; leaves simple or compound; trees or shrubs or herbs, sometimes climbing ..... **FABACEAE**
3b Flowers irregular:
4a Leaves 2-pinnate; stipules present; trees, shrubs or herbs, sometimes climbing; flowers in spikes or heads ..... **FABACEAE**
4b Leaves simple, 1-pinnate or 1–3-foliolate:
5a Leaves pinnate or 3-foliolate, the leaflets dotted with pellucid glands, at least at margin; trees or shrubs ..... **RUTACEAE**
5b Leaves simple or 1-foliolate, without pellucid glands:
6a Leaves toothed; stipules present; stamens as many as and opposite petals, united at base; herbs or small shrubs ..... **STERCULIOIDEAE—MALVACEAE**
6b Leaves entire; stipules absent; stamens more numerous than petals; trees or shrubs, sometimes climbing:
7a Sepals 5; petals 5; flowers in few-flowered racemes ..... **CONNARACEAE**
7b Sepals 3; petals 6; flowers solitary, axillary ..... **ANNONACEAE**
2b Gynoecium composed of 2 or more united carpels, thus with 2 or more placentas:
8a Leaves scale-like, dense; shrubs or small trees ..... **TAMARICACEAE**
8b Leaves not scale-like:
9a Leaves opposite or whorled, simple, not all radical; herbs:
10a Leaves dotted with pellucid glands; stamens more than twice as many as petals, often ± grouped into bundles; terrestrial plants ..... **CLUSIACEAE**
10b Leaves bladdery, whorled; stamens as many as petals; free-floating aquatics ..... **DROSERACEAE**
9b Leaves alternate or all radical:
11a Flowers unisexual:
12a Flowers often with a single or double, cup-shaped or variously dissected corona; disc often present; herbaceous or woody climbers, shrubs or small trees, often with tendrils; leaves sometimes digitate or palmately lobed ..... **PASSIFLORACEAE**
12b Flowers without corona; disc present or absent; trees or shrubs without tendrils; leaves simple, not lobed:
13a Resinous trees or shrubs with schizogenous secretory canals; sepals, petals and stamens all 5; fruit a ± globose capsule usually opening with 2 valves, with 4–8 orange to red, sticky seeds borne in 2 rows on each valve ..... **PITTOSPORACEAE**
13b Combination of characters not as above:
14a Anthers shorter than 1 mm or inflorescence epiphyllous; disc absent ..... **ACHARIACEAE**
14b Anthers longer than 1 mm; inflorescence not epiphyllous; disc present ..... **SALICACEAE**
11b Flowers bisexual or plants sometimes polygamous:
15a Ovary borne on a distinct gynophore:
16a Flowers with a fimbriate or hairy corona outside stamens; styles 3–6; herbs, shrubs or small trees often with axillary tendrils ..... **PASSIFLORACEAE**
16b Flowers without a corona; style 1 or stigma sessile; tendrils absent:
17a Flowers mostly 4-merous; leaves without extrafloral nectaries and mostly ± glabrous; ovary 1-locular throughout ..... **CAPPARACEAE**
17b Flowers 5-merous; leaves hairy, often glandular, with an extrafloral nectary at base of midrib; ovary 3–5-locular, sometimes 1-locular towards apex ..... **DIPTEROCARPACEAE**
15b Ovary sessile or subsessile:
18a Flowers ± irregular:
19a Leaves 2- or 3-pinnate; trees; flowers in axillary panicles; stamens 5, alternating with 5 staminodes ..... **MORINGACEAE**
19b Leaves simple or digitate; herbs or sometimes shrubs or small trees:
20a Connective of anthers prolonged above thecae into an appendage; flowers mostly solitary; fruit a 3-valved capsule; leaves simple ..... **VIOLACEAE**
20b Connective of anthers not prolonged above thecae; flowers in terminal racemes or spikes:
21a Fruit a capsule dehiscing throughout its length by 2 valves; leaves simple or digitate ..... **CAPPARACEAE**
21b Fruit a capsule gaping at apex; leaves simple, sometimes pinnately lobed or divided ..... **RESEDACEAE**
18b Flowers regular:
22a Stamens 10, with filaments connate into a tube ± as long as the 10 petals ..... **CANELLACEAE**
22b Combination of characters not as above:
23a Stamens more numerous than petals, or as many and opposite them:
24a Flowers with a disc and/or a corona:
25a Flowers often with a single or double corona, cup-shaped or variously dissected; herbaceous or woody climbers, shrubs or small trees, often with tendrils; leaves sometimes digitate or palmately lobed .... **PASSIFLORACEAE**
25b Flowers without corona; trees or shrubs without tendrils; leaves simple, not lobed:

26a Branches and inflorescence axis with rusty scales; petiole with basal and apical pulvinus; pedicels with 5 or 6 apical glands; fruit a loculicidal capsule with dense stiff bristles; anthers horseshoe-shaped, opening by short, apical, pore-like slits ..... ***BIXACEAE**

26b Branches and inflorescence axis without scales; petioles without pulvinus; fruit a fleshy berry, a capsule, or large, globose and indehiscent but without dense bristles; anthers opening by longitudinal slits ..... **SALICACEAE**

24b Flowers without a disc or a corona:

27a Perennial or annual herbs:

28a Leaves prickly, often pinnately lobed; sepals 2 or 3, caducous; fruit a capsule dehiscing by 4–6 short valves at the top ..... ***PAPAVERACEAE**

28b Leaves glabrous, entire; sepals 5; fruit a capsule opening by 3 septicidal valves .... (*Sauvagesia*) **OCHNACEAE**

27b Trees or shrubs:

29a Leaves palmately lobed; fruit a 3–5-valved capsule ..... **COCHLOSPERMACEAE**

29b Leaves simple; fruit a berry, a capsule, a nut or of separate drupelets:

30a Gynoecium of 5–15 ± free, 1-ovulate carpels united by their completely fused styles; fruit of separate 1-seeded drupelets ..... **OCHNACEAE**

30b Gynoecium with a 1–5-locular ovary with 1–many ovules; fruit a capsule, nut-like or a berry:

31a Fruit nut-like, 1-seeded, with a very hard pericarp surrounded by 5 wing-like, accrescent, prominently veined sepals; leaves entire ..... **DIPTEROCARPACEAE**

31b Fruit a capsule or berry, not surrounded by wing-like sepals; leaves entire or toothed ..... **ACHARIACEAE**

23b Stamens as many as and alternating with petals:

32a Styles 2–5, free or shortly united at base:

33a Leaves bearing many sticky, stipitate glands; insectivorous herbs ..... **DROSERACEAE**

33b Leaves without sticky glands; plants not insectivorous:

34a Flowers with a conspicuous, fimbriate or hairy corona outside stamens; herbs or shrubs, often climbing with tendrils ..... **PASSIFLORACEAE**

34b Flowers without a corona, or corona very small and inconspicuous; herbs without tendrils .... **TURNERACEAE**

32b Style 1:

35a Stamens variously united, connective of anthers prolonged above thecae into an appendage; leaves with stipules ..... **VIOLACEAE**

35b Stamens ± free, anthers without an appendage; leaves without stipules ..... **PITTOSPORACEAE**

GROUP 5 (*Placentation parietal; ovary superior; petals ± united*)

1a Gynoecium consisting of 1 carpel, therefore with only 1 placenta in ovary; leaves with or without stipules:

2a Leaves simple or compound, with stipules or stipular spines; fruit a legume ..... **FABACEAE**

2b Leaves simple; stipules absent; fruit a drupe containing a solitary U-shaped seed ..... **MENISPERMACEAE**

1b Gynoecium consisting of 2 or more united carpels, therefore with 2 or more placentas in ovary; leaves without stipules:

3a Flowers irregular:

4a Leaves pinnately or ternately compound:

5a Leaves alternate; annual herbs with watery sap, sometimes with tendrils; outer petals often spurred or saccate at base ..... ***FUMARIACEAE**

5b Leaves opposite; trees with large pendulous, sausage-like fruits ..... **BIGNONIACEAE**

4b Leaves simple, sometimes reduced to scales; herbs:

6a Plants parasitic on roots; leaves reduced to scales; stamens 4 ..... **SCROPHULARIACEAE**

6b Plants not parasitic; leaves (or solitary leaf) well-developed; stamens 2 ..... **GESNERIACEAE**

3b Flowers regular; stamens as many as corolla lobes or more numerous:

7a Leaves opposite:

8a Petals many; succulent herbs or shrubs with succulent leaves ..... **MESEMBRYANTHEMACEAE**

8b Petals 4–6:

9a Shrubs or woody climbers with latex; fruit a large berry ..... **APOCYNACEAE**

9b Herbs without latex; fruit a capsule, rarely berry-like ..... **GENTIANACEAE**

7b Leaves alternate or basal, sometimes small and scale-like:

10a Flowers unisexual; plants monoecious or dioecious, with large leaves clustered at and near apex of unbranched to sparsely branched, sometimes prickly stems and branches ..... **CARICACEAE**

10b Flowers bisexual; habit of plants not as above:

11a Leaves small, scale-like; trees or shrubs, often halophytic ..... **TAMARICACEAE**

11b Leaves well-developed:

12a Stamens more numerous than petals; petals twice as many as sepals; trees or shrubs, sometimes climbing ..... **ANNONACEAE**

12b Stamens, petals and sepals all 5(6):

13a Herbs, aquatic or wetland; stamens arising on corolla tube ..... **MENYANTHACEAE**

13b Small trees or shrubs; stamens free from corolla tube ..... **PITTOSPORACEAE**

GROUP 6 (*Placentation parietal; ovary ± inferior*)

1a Plants parasitic on roots of shrubs or trees, low, ± fleshy:
2a Perianth tubular, 3- or 4(5)-lobed, resembling a fungus ..... **HYDNORACEAE**
2b Perianth cup-shaped, 4–9-lobed, fused towards base ..... **RAFFLESIACEAE**
1b Plants not parasitic:
3a Petals absent: perianth members all ± similar:
4a Flowers irregular, usually with an S-shaped tube, medium-sized to large ..... **ARISTOLOCHIACEAE**
4b Flowers regular; tepals fused only towards base; fruit winged, horned or spiny ..... **AIZOACEAE**
3b Petals present: perianth differentiated into calyx and corolla:
5a Flowers unisexual; plants usually climbing with tendrils; leaves often palmately lobed or deeply divided ..... **CUCURBITACEAE**
5b Flowers bisexual; plants without tendrils; leaves mostly entire, rarely with palmate venation:
6a Leaves absent or reduced to scales; succulent shrubs or shrublets, sometimes epiphytic. ..... **CACTACEAE**
6b Leaves mostly well-developed:
7a Succulent herbs or shrubs with succulent leaves; leaves mostly opposite; petals many ..... **MESEMBRYANTHEMACEAE**
7b Plants not succulent; leaves opposite or alternate; petals fewer than 10:
8a Leaves opposite or whorled, with interpetiolar stipules ..... **RUBIACEAE**
8b Leaves alternate; stipules, if present, not interpetiolar:
9a Aquatic herbs with usually floating peltate leaves ..... **NYMPHAEACEAE**
9b Trees or shrubs:
10a Petals mostly larger and more numerous than sepals; anthers longer than 1 mm, often linear; disc or separate disc glands mostly present ..... **ACHARIACEAE**
10b Petals absent or present, mostly as many as and similar to sepals; anthers mostly shorter than 1 mm and not much longer than broad; disc or disc glands mostly absent ..... **SALICACEAE**

GROUP 7 (*Placentation axile, basal or apical; ovary superior; petals absent*)

1a Ovary with 2 or more ovules in each locule:
2a Plants aquatic; moss-like or liverwort-like in habit, growing on rocks; flowers small and inconspicuous; stamens 1 or 2; ovary with many ovules; fruit a capsule ..... **PODOSTEMACEAE**
2b Plants terrestrial, not moss-like or liverwort-like in habit:
3a Leaves reduced to minute scales forming toothed sheaths surrounding nodes of pine needle-like, jointed branchlets; trees with unisexual flowers; male flowers in spikes, female flowers in heads; stamen 1; ovary 1-locular with 2 collateral ovules; style with 2 elongated branches ..... ***CASUARINACEAE**
3b Leaves well-developed, not reduced to scales:
4a Leaves opposite or whorled or all radical:
5a Flowers unisexual; trees, shrubs or shrublets:
6a Calyx absent; leaves toothed at apex, fan-like; flowers in catkin-like spikes; ovules many in each locule ..... **MYROTHAMNACEAE**
6b Calyx present; leaves entire, not fan-like; flowers solitary or fasciculate in axils of leaves; ovules 2 in each locule:
7a Leaves with stipules; plants dioecious; stamens very many, spirally arranged on prolonged floral axis ..... **EUPHORBIACEAE**
7b Leaves without stipules; plants monoecious; stamens 4–6 ..... **BUXACEAE**
5b Flowers bisexual; herbs:
8a Calyx spurred, spur adnate to pedicel; ovary beaked; leaves toothed or lobed ..... **GERANIACEAE**
8b Calyx not spurred; ovary without stout central axis; leaves entire:
9a Sepals fused below; stamens perigynous, arising on calyx tube:
10a Style 1; ovary 1–5-locular, with many ovules in each locule; fruit a capsule ..... **LYTHRACEAE**
10b Styles 2–5, or if 1 then ovary 1-locular with few ovules; fruit a circumscissile capsule ..... **AIZOACEAE**
9b Sepals free or almost so; stamens hypogynous:
11a Ovary 2–5-locular, with axile placentas ..... **MOLLUGINACEAE**
11b Ovary 1-locular with basal or free-central placentation ..... **CARYOPHYLLACEAE**
4b Leaves alternate, not all radical:
12a Leaves pinnate; trees, polygamous or with flowers all unisexual; ovary 2-locular with 2 ovules in each locule; fruit indehiscent ..... **SAPINDACEAE**
12b Leaves simple or digitate:
13a Ovary 1-locular; flowers in racemes or spikes:
14a Flowers mostly bisexual but plants sometimes polygamous:
15a Calyx scarious; fruit a ± circumscissile capsule; herbs ..... **AMARANTHACEAE**
15b Calyx of 4 thickish lobes; fruit consisting of 1 or more follicles; gland-dotted shrubs ..... **RUTACEAE**
14b Flowers unisexual; plants dioecious; calyx, if present, not scarious; fruit a drupe or a capsule; trees or shrubs, sometimes climbing:
16a Perianth absent; inflorescences small dense catkins; seeds many, very small with a basal tuft of long dense hairs ..... **SALICACEAE**
16b Perianth present; combination of characters not as above:

17a Leaves with stipules; calyx imbricate; stamens opposite sepals; styles 3, usually 2-lobed ..... **EUPHORBIACEAE**
17b Leaves without stipules; calyx valvate; stamens alternating with sepals; style absent, stigma sessile and multiradiate ..... **ICACINACEAE**

13b Ovary 2- or more-locular:
18a Gynoecium composed of 3 or more loosely united carpels, in fruit separating into as many follicles (or fewer by abortion); trees or shrubs with flowers both bi- and unisexual; leaves simple or digitate; sepals valvate, united below; stamens united into a column ..... **Sterculioideae—MALVACEAE**
18b Gynoecium composed of completely united carpels, in fruit forming a capsule, or indehiscent or finally separating into winged cocci:
19a Ovary borne on a distinct gynophore; flowers bisexual; shrubs with solitary, pedunculate, axillary flowers ..... **CAPPARACEAE**
19b Ovary sessile or subsessile:
20a Flowers bisexual; perianth segments sepaloid externally and petaloid internally ..... **AIZOACEAE**
20b Flowers mostly unisexual; plants occasionally polygamous:
21a Leaves with stipules; fruit a capsule, or indehiscent, or separating into 2 winged cocci; trees or shrubs or herbs ..... **EUPHORBIACEAE**
21b Leaves without stipules; fruit a septicidal capsule with 2 or more longitudinal, membranous wings; shrubs or trees .... **SAPINDACEAE**

1b Ovary with 1 ovule in each locule:
22a Ovary 2- or more-locular:
23a Leaves pinnate or 3-foliolate:
24a Leaves pinnate, alternate; trees or shrubs ..... **SAPINDACEAE**
24b Leaves 3-foliolate, opposite; subshrubs ..... **ZYGOPHYLLACEAE**
23b Leaves simple, sometimes lobed or much divided or reduced to scales or stipular spines:
25a Flowers unisexual or plants polygamous:
26a Ovary 5-locular, carpels loosely united and becoming separate in fruit; calyx present, valvate, sepals united below; stamens 5–10, united into a column; leaves alternate; trees or shrubs ..... **Sterculioideae—MALVACEAE**
26b Ovary 2–4-locular, carpels completely united and not becoming separate in fruit; leaves alternate or sometimes opposite, sometimes reduced to scales or stipular spines; calyx present or absent, sepals valvate or imbricate; stamens 1–many, free or variously united; habit varying from annuals to trees ..... **EUPHORBIACEAE**
25b Flowers bisexual:
27a Sepals fused into a very short to long tube; stamens perigynous or hypogynous:
28a Stamens arising on upper portion of calyx tube, in 2 whorls; fruit a drupe; shrubs ..... **THYMELAEACEAE**
28b Stamens not arising on sepals, sometimes in groups; fruit a capsule or flat samara with membranous wings:
29a Trees with dentate leaves; fruit a flattened samara ..... **CELTIDACEAE**
29b Herbs, shrublets or shrubs with entire, often somewhat succulent leaves; fruit a capsule ..... **AIZOACEAE**
27b Sepals free; stamens hypogynous or almost so:
30a Leaves ± toothed or pinnately lobed or divided; style 1; fruit a flattened silicule or separating into 2 cocci; herbs .... **BRASSICACEAE**
30b Leaves entire; styles 2 or more, free or united at base:
31a Ovary 7–10-locular; fruit a berry; flowers in spike-like racemes; herbs or shrublets ..... **PHYTOLACCACEAE**
31b Ovary 2–5-locular; fruit a loculicidal capsule or separating into 2 cocci, cocci sometimes winged along back; flowers in lax or dense cymes; herbs ..... **MOLLUGINACEAE**
22b Ovary 1-locular:
32a Leaves absent or reduced to scales; flowers spicate:
33a Slender, twining, parasitic plants; flowers not immersed in rachis of spike; stamens 6–9, accompanied by staminodes; anthers opening by valves ..... **LAURACEAE**
33b Succulent, maritime herbs with articulated branches, not parasitic; flowers immersed in rachis of spike; stamens 1 or 2; anthers opening by longitudinal slits ..... **CHENOPODIACEAE**
32b Leaves present, well-developed, not reduced to scales:
34a Leaves with stipules, sometimes forming a sheath (ocrea) surrounding the stem:
35a Leaves 3- or 4-pinnate; calyx petaloid; fruit a stipitate achene borne on a slender pedicel; herbs ..... **RANUNCULACEAE**
35b Leaves simple or digitate:
36a Ovule pendulous from apex or near apex of ovary; flowers unisexual or plants polygamous:
37a Flowers densely spicate or capitate, or crowded in or on an open or flat receptacle or inside a hollow, almost closed receptacle (fig), female flowers sometimes immersed in tissue of receptacle; calyx sometimes absent; trees, shrubs or herbs ..... **MORACEAE**
37b Flowers solitary or fasciculate or in cymes or racemes or panicles; calyx sometimes reduced or absent in female flowers:
38a Annual herbs; leaves opposite or alternate, all or lower ones palmately divided; male flowers in elongated panicles; female flowers spicate, enclosed by bracts; fruit dry, indehiscent ..... ***CANNABACEAE**
38b Trees or shrubs; leaves alternate:
39a Stamens as many as calyx segments, 4 or 5; style 2-branched with simple or divided stigmas; fruit a drupe; trees or shrubs ..... **CELTIDACEAE**
39b Stamens more numerous than calyx segments; style unbranched, sometimes very short:

40a Flowers solitary or paired in axils of leaves; leaves 1–3-foliolate with small, narrow leaflets; heath-like shrubs ..... **ROSACEAE**

40b Flowers in axillary racemes or panicles; leaves simple; trees ..... **EUPHORBIACEAE**

36b Ovule arising from base or near base of ovary:

41a Leaves opposite, marked with cystoliths; flowers unisexual; herbs or shrubs ..... **URTICACEAE**

41b Leaves alternate:

42a Perianth absent; flowers minute, in dense spikes; shrubs, sometimes climbing ..... **PIPERACEAE**

42b Perianth present:

43a Styles 2 or 3, free or united below; stamens 4–8; fruit a small nut; stipules often forming an ocrea surrounding the stem; herbs or shrubs, sometimes climbing ..... **POLYGONACEAE**

43b Style 1 or absent; stamens 5 or fewer:

44a Flowers bisexual; sepals united below, free portions alternating with lobes of an epicalyx; style arising laterally from near base of ovary; herbs with palmately lobed leaves ..... **ROSACEAE**

44b Flowers unisexual; sepals free or united, without an epicalyx; style or sessile stigma terminal:

45a Herbs, subshrubs or shrubs, sometimes softwooded small trees or climbers, sometimes with stinging hairs; leaves simple, sometimes 3–5(–7)-lobed, often marked with cystoliths; plants monoecious or dioecious; stamens inflexed in bud, abruptly bending in dehiscence ..... **URTICACEAE**

45b Trees or shrubs, often with stilt-roots, without stinging hairs; leaves palmatifid to palmatisect, without cystoliths; plants strictly dioecious; stamens straight in bud, not abruptly bending in dehiscence ..... **CECROPIACEAE**

34b Leaves without stipules:

46a Submerged, aquatic herbs; leaves whorled, deeply and bifurcately divided into linear or filiform segments; flowers unisexual, solitary and sessile in axils of leaves ..... **CERATOPHYLLACEAE**

46b Plants not aquatic; leaves alternate or opposite, undivided or sometimes pinnately divided:

47a Perianth absent; flowers in spikes:

48a Flowers unisexual; stamens 3–12; styles 2, free or shortly united below; leaves alternate; trees or shrubs ..... **MYRICACEAE**

48b Flowers bisexual; stamens 2; style absent, stigma sessile; leaves alternate or opposite or whorled; herbs, sometimes trailing or climbing or epiphytic ..... **PIPERACEAE**

47b Perianth present, at least in male flowers:

49a Stamens twice as many as calyx segments or more numerous:

50a Ovule erect from base of ovary; fruit enclosed in persistent, longitudinally 4-winged calyx tube; spiny shrubs with small, linear, often fasciculate leaves; plants polygamo-dioecious ..... **NYCTAGINACEAE**

50b Ovule pendulous from apex of ovary; fruit not enclosed in winged calyx tube; plants not spiny:

51a Flowers bisexual; sepals united into an elongated tube; stamens arising on calyx tube; style elongated, slender; shrubs, often heath-like, or sometimes trees, with alternate or opposite leaves ..... **THYMELAEACEAE**

51b Flowers unisexual; plants dioecious; sepals shortly united at base; stamens not arising on calyx tube; style absent, stigma sessile; shrubs or trees with opposite or subopposite leaves ..... **MONIMIACEAE**

49b Stamens fewer than twice as many as calyx segments, sometimes accompanied by staminodes:

52a Anthers opening by valves; calyx 6-lobed; stamens 6–9, accompanied by staminodes; trees ..... **LAURACEAE**

52b Anthers opening by longitudinal slits; calyx with 3–5 segments or lobes:

53a Leaves opposite or subopposite:

54a Perianth lobes ± petaloid, united into a tube constricted above ovary, lower portion of tube persistent and enclosing fruit and often glandular on outside; stamens not accompanied by staminodes; herbs or climbing shrubs ..... **NYCTAGINACEAE**

54b Perianth lobes dry and ± scarious, free or shortly united at base, not forming a tube constricted above ovary; stamens as many as and opposite calyx segments, often alternating with staminodes; herbs or shrubs ..... **AMARANTHACEAE**

53b Leaves alternate:

55a Twining herbs; sepals (petals?) united below into a tube with 2 adnate bracteoles outside; flowers in axillary, pedunculate spikes ..... **BASELLACEAE**

55b Plants not twining, or if so, woody lianes; sepals free or united, without adnate bracteoles:

56a Perianth of 2–4 valvate segments; trees or shrubs:

57a Flowers bisexual, in large, bracteate heads or in elongated spikes or racemes; stamens 4, free, opposite to and arising on calyx segments; fruit a nut; seed not arillate ..... **PROTEACEAE**

57b Flowers unisexual, in small, solitary or clustered (sometimes paniculate) heads; stamens 3–5, united into a column; fruit with a thick, fleshy, dehiscent pericarp; seed arillate ..... **MYRISTICACEAE**

56b Perianth of 3–5 imbricate segments or sometimes almost completely tubular with indistinct segments; herbs, shrubs or woody climbers:

58a Stamens fewer than calyx segments and mostly alternating with them; leaves small, linear; flowers in elongated, simple spikes ..... **PHYTOLACCACEAE**

58b Stamens as many as or fewer than calyx segments and opposite them:

59a Disc of 4 or 5 fleshy lobes alternating with petals (may be taken for sepals as calyx is reduced to a rim); woody climbers ..... **OPILIACEAE**

59b Disc absent:

60a Perianth dry and ± scarious, free or shortly united at base; leaves entire ..... **AMARANTHACEAE**
60b Perianth herbaceous, free or ± united into a tube; leaves entire or ± toothed or pinnately divided ..... **CHENOPODIACEAE**

GROUP 8 (*Placentation axile, basal or apical; ovary superior; petals free but may adhere to base of staminal tube*)

1a Ovary 1-locular, sometimes septate towards base:
2a Sepals 1 or 2, free, sometimes caducous:
3a Flowers unisexual; plants dioecious; sepals 1 or 2; petals 1–4; stamens united into a synandrium; leaf blades peltate or subpeltate; woody climbers ..... **MENISPERMACEAE**
3b Flowers bisexual or, if unisexual, then stamens free; sepals 2; petals 4 or 5; leaf blades not peltate; herbs:
4a Flowers irregular; ovary with 1 ovule; fruit a nut; leaves much divided ..... ***FUMARIACEAE**
4b Flowers regular; ovary with many ovules; fruit a capsule; leaves entire, fleshy ..... **PORTULACACEAE**
2b Sepals (or calyx lobes) 3 or more, sometimes ± obsolete (calyx annular):
5a Leaves opposite or whorled, not all radical:
6a Leaves with stipules; herbs or shrublets ..... **CARYOPHYLLACEAE**
6b Leaves without stipules:
7a Petals and stamens perigynous, arising on calyx tube:
8a Ovary with 1 apical, pendulous ovule; fruit indehiscent, dry or fleshy; often heath-like ..... **THYMELAEACEAE**
8b Ovary with many ovules on a basal or free-central placenta; stamens twice as many as petals or fewer; herbs, shrubs or trees ..... **LYTHRACEAE**
7b Petals and stamens hypogynous or only slightly perigynous, not arising on calyx:
9a Herbs; ovary with 1–many ovules on a basal or free-central placenta; fruit a capsule ..... **CARYOPHYLLACEAE**
9b Trees or shrubs; ovary with 1 or 2 ovules; fruit drupaceous; stamens as many as and alternating with petals:
10a Filaments united at base into a tube or cup ..... **SALVADORACEAE**
10b Filaments ± free:
11a Ovule 1; styles 3, free or united at base; flowers unisexual; plants dioecious or polygamous ..... **ANACARDIACEAE**
11b Ovules 2–8; style 1 or stigma sessile; flowers bisexual:
12a Ovules 2, pendulous from apex of ovary ..... **ICACINACEAE**
12b Ovules 2–8, erect from base of ovary ..... **CELASTRACEAE**
5b Leaves alternate, sometimes all radical:
13a Leaves compound with 3 or more leaflets; trees or shrubs, sometimes climbing:
14a Leaves 2-pinnate; flowers bisexual; fruit winged, indehiscent ..... **FABACEAE**
14b Leaves 1-pinnate or 3-foliolate; flowers unisexual; plants polygamous or dioecious; fruit drupaceous ..... **ANACARDIACEAE**
13b Leaves simple or 1-foliolate:
15a Ovary with 1 ovule:
16a Flowers irregular; the inner 2 sepals larger than the others, the lowest (median) petal forming a keel, the upper 2 petals vestigial or absent; fruit long-winged, indehiscent; trees or shrubs, sometimes climbing ..... **POLYGALACEAE**
16b Flowers regular; fruit unwinged, but sometimes surrounded by persistent wing-like sepals:
17a Leaves with stipules; stamens as many as petals; herbs ..... **CARYOPHYLLACEAE**
17b Leaves without stipules:
18a Sepals united into an elongated tube; stamens mostly twice as many as petals, arising on calyx tube; shrubs, sometimes heath-like ..... **THYMELAEACEAE**
18b Sepals free or almost so; calyx sometimes reduced to a rim:
19a Stamens united into a synandrium; leaf blade peltate or subpeltate; woody, dioecious climbers .. **MENISPERMACEAE**
19b Stamens free or almost so; leaf blade not peltate:
20a Plants polygamous or dioecious; stamens 1–10; trees or shrubs ..... **ANACARDIACEAE**
20b Plants with bisexual flowers; stamens as many as and opposite petals; woody climbers ..... **OPILIACEAE**
15b Ovary with 2 or more ovules:
21a Anthers opening by 2 upcurving valves; shrubs with 3-partite spines at the nodes; fruit a berry ..... **BERBERIDACEAE**
21b Anthers opening by longitudinal slits; combination of characters not as above:
22a Leaves with stipules:
23a Stamens as many as and opposite petals:
24a Stamens with filaments united into a tube; subshrubs or shrublets with stellate, tufted and simple hairs ..... **Byttnerioideae—MALVACEAE**
24b Stamens with free filaments; scrambling or erect shrubs or trees, glabrous or hairs, if present, not stellate ..... **Homalieae** (*Gerrardina*)—**SALICACEAE** (in broad sense)
23b Stamens more numerous than petals, free:
25a Petals and stamens perigynous, arising at mouth of calyx tube ..... **ROSACEAE**
25b Petals and stamens hypogynous; small trees or shrubs; leaves palmately lobed ..... **COCHLOSPERMACEAE**
22b Leaves without stipules; trees or shrubs:
26a Petals imbricate; stamens as many as and opposite petals; ovules on a free-central or basal placenta ..... **MYRSINACEAE**
26b Petals valvate:

27a Ovules 2 per locule, pendulous from apex of ovary; stamens as many as and alternating with petals ..... **ICACINACEAE**

27b Ovules 2–5 per locule, pendulous from apex of a central placenta; stamens as many as and opposite petals, or up to twice as many, or reduced to 3 and accompanied by staminodes ..... **OLACACEAE**

1b Ovary 2- or more-locular; if carpels ± free then they are united by their fused styles:

28a Stamens opposite to and usually as many as petals:

29a Filaments ± united into a tube or cup, alternating with staminodes; calyx lobes valvate; herbs or shrubs, often with stellate hairs ..... **DOMBEYOIDEAE—MALVACEAE**

29b Filaments connate only at base or quite free, not alternating with staminodes or staminodes absent; stellate hairs present or absent:

30a Ovary with few to many ovules in each locule; fruit a loculicidal capsule; flowers in mainly terminal panicles; trees or shrubs:

31a Small, aromatic trees or shrubs without stellate hairs; stipules rudimentary; flowers usually unisexual by abortion; style 1 ..... **HETEROPYXIDACEAE**

31b Herbs, shrublets or undershrubs, frequently stellate-pubescent; stipules often foliaceous, rarely absent; flowers bisexual; styles 5, rarely 1 ..... **BYTTNERIOIDEAE—MALVACEAE**

30b Ovary with 1 or 2 ovules in each locule; fruit drupaceous or baccate:

32a Inflorescences leaf-opposed; herbaceous or woody plants, often climbing with tendrils; leaves simple (often lobed or divided) or digitate; ovules 2 in each locule; fruit a berry ..... **VITACEAE**

32b Inflorescences axillary; trees or shrubs, often spiny, without tendrils; leaves simple, undivided; ovules 1 in each locule; fruit drupaceous ..... **RHAMNACEAE**

28b Stamens, at least those of inner whorl, alternating with petals, as many as or more numerous or fewer than petals:

33a Leaves compound, with 2 or more leaflets:

34a Inflorescences bearing tendrils; climbing shrubs or herbs; leaves pinnate or 2-ternate ..... **SAPINDACEAE**

34b Inflorescences without tendrils:

35a Herbs; stamens mostly twice as many as petals, sometimes as many as petals:

36a Style simple or stigma sessile; leaves mostly opposite, rarely alternate, 2- or 3-foliolate or pinnate ..... **ZYGOPHYLLACEAE**

36b Styles 5, rarely fewer; leaves alternate or radical, digitately or pinnately compound ..... **OXALIDACEAE**

35b Trees or shrubs, sometimes climbing:

37a Anthers 1-thecous; leaves digitate, 3–9-foliolate; stamens 10 or more, filaments united below ..... **BOMBACOIDEAE—MALVACEAE**

37b Anthers 2-thecous; leaves pinnate or 2-pinnate or 2- or 3-foliolate:

38a Leaves opposite or subopposite:

39a Leaves imparipinnate or 3-foliolate, dotted with pellucid glands, at least at margin; fruit baccate or separating into 2–4 mericarps ..... **RUTACEAE**

39b Leaves paripinnate, leaflets without pellucid glands; fruit a compressed capsule with winged seeds ... **PTAEROXYLACEAE**

38b Leaves alternate:

40a Leaves with lateral or intrapetiolar stipules, imparipinnate; flowers ± irregular, in racemes; stamens 4 or 5 ..... **MELIANTHACEAE**

40b Leaves without stipules, or stipules modified into recurved spines:

41a Filaments united into a tube; leaves pinnate or 2-pinnate ..... **MELIACEAE**

41b Filaments free or only shortly united at base:

42a Leaflets dotted with pellucid glands; leaves pinnate or 3-foliolate ..... **RUTACEAE**

42b Leaflets without pellucid glands:

43a Ovary with 2 or more ovules in each locule:

44a Ovules many in each locule; styles 5; fruit baccate; leaves pinnate ..... **OXALIDACEAE**

44b Ovules 2 in each locule:

45a Fruit drupaceous; plants resinous ..... **BURSERACEAE**

45b Fruit a capsule; carpels separating from a persistent central column; plants not resinous ..... **PTAEROXYLACEAE**

43b Ovary with 1 ovule in each locule:

46a Styles 3–5, free and separated at base:

47a Carpels almost free, joined only at the base; young stems and leaves ferruginous-pubescent or tomentose ... (*Brucea*) **SIMAROUBACEAE**

47b Carpels fused except for the styles ..... **ANACARDIACEAE**

46b Style or styles central or terminal, not separated at base:

48a Fruit a compressed, 2-locular, 2-seeded capsule with carpels separating and eventually suspended from the bipartite axis; ovules on axile placenta; seeds winged ..... **PTAEROXYLACEAE**

48b Fruit a drupe or capsule, sometimes bladdery or winged, if separating into carpels suspended from a central axis then carpels 4 or 8; ovules erect, ascending or pendulous:

49a Ovules erect or ascending; leaves paripinnate or 2-pinnate or 2- or 3-foliolate ..... **SAPINDACEAE**

49b Ovules pendulous:

50a Leaves 2-foliolate; branches armed with straight spines ..... **BALANITACEAE**

50b Leaves imparipinnate, tufted at ends of branchlets; branches unarmed or with prickles:

51a Fruit dry, sharply 4-angled, at length separating into 4 or 8 1-seeded triquetrous cocci suspended from the top of a central carpophore ..... **KIRKIACEAE**

51b Fruit a berry or of separate drupaceous mericarps ..... **SIMAROUBACEAE**

33b Leaves simple or 1-foliolate, sometimes deeply divided:

52a Perianth irregular; sepals 3 or 5, the median one extended into a hollow nectariferous spur or sac:

53a Leaves basifixed; petals 3; stamens 5, anthers united around ovary; fruit an explosively dehiscent capsule; herbs ..... **BALSAMINACEAE**

53b Leaves peltate; petals 5; stamens 4 + 4; fruit dividing into 3 1-seeded fleshy mericarps ..... ***TROPAEOLACEAE**

52b Perianth regular or slightly irregular, not spurred:

54a Leaves opposite or whorled, not all radical:

55a Stamens more than twice as many as petals:

56a Leaves with stipules:

57a Trees or shrubs; stipules interpetiolar; petals fringed at apex; stamens 15–45, filaments not united into bundles ..... **RHIZOPHORACEAE**

57b Herbs; stipules not interpetiolar; petals not fringed; stamens 15, filaments united below into 5 bundles ..... **GERANIACEAE**

56b Leaves without stipules; sepals free; stamens and petals hypogynous; filaments irregularly arranged or ± united into bundles; styles 1–5 or absent; leaves usually dotted or streaked with pellucid or opaque glands; trees, shrubs or herbs ..... **CLUSIACEAE**

55b Stamens up to twice as many as petals:

58a Sepals united below into a tube:

59a Petals perigynous, arising at mouth of calyx tube; ovary with many ovules in each locule:

60a Anthers opening by apical pores; connective often appendaged below anther; leaves with 3 or more parallel longitudinal nerves; herbs or shrubs ..... **MELASTOMATACEAE**

60b Anthers opening by longitudinal slits; connective unappendaged; leaves without parallel longitudinal nerves; herbs, shrubs or trees ..... **LYTHRACEAE**

59b Petals hypogynous, not arising on calyx tube; ovary with 1–3 ovules per locule:

61a Succulent annuals ..... **ZYGOPHYLLACEAE**

61b Trees or shrubs:

62a Stamens twice as many as petals; leaves with interpetiolar stipules; petals fringed at apex; plants not spiny ..... **RHIZOPHORACEAE**

62b Stamens as many as petals; leaves without stipules; petals not fringed; plants spiny ..... **SALVADORACEAE**

58b Sepals free or almost so:

63a Ovary with 1 ovule in each fertile locule (sometimes 1 or 2 of the locules empty); stamens twice as many as petals; fruit winged; shrubs, often climbing ..... **MALPIGHIACEAE**

63b Ovary with 2 or more ovules in each locule:

64a Leaves lobed or deeply divided; ovary beaked; herbs or shrublets ..... **GERANIACEAE**

64b Leaves not lobed or divided; ovary without a stout central axis:

65a Styles 3–5:

66a Ovary with many ovules in each locule; sepals entire; leaves with stipules ..... **ELATINACEAE**

66b Ovary with 2 ovules in each locule; sepals toothed or lobed at apex; leaves without stipules ..... **LINACEAE**

65b Style 1:

67a Herbs or subshrubs; leaves succulent or glaucous ..... **ZYGOPHYLLACEAE**

67b Trees or shrubs, sometimes climbing:

68a Stamens 10, twice as many as petals ..... **CTENOLOPHONACEAE**

68b Stamens as many as or fewer than petals:

69a Stamens as many as petals, alternating with petaloid staminodes; leaves dotted with pellucid glands ..... **RUTACEAE**

69b Stamens as many as or fewer than petals, not alternating with staminodes; leaves without translucent glands ..... **CELASTRACEAE**

54b Leaves alternate or fascicled, sometimes all radical:

70a Ovary with 1 ovule in each fertile locule (sometimes 1 or 2 of the locules empty):

71a Flowers unisexual (often by abortion) or plants polygamous:

72a Ovary of (1)2–5(6) free carpels; fruit of separate follicles, each with 1 large seed ..... **BROWNLOWIOIDEAE** (*Christiana*)—**MALVACEAE**

72b Ovary of fused carpels:

73a Ovary 2-locular with 1(2) pendulous ovules per locule; stigma large, ± sessile; fruit a 2-valved capsule, each valve prolonged by 2 foliaceous wings ..... **BROWNLOWIOIDEAE** (*Berrya*)—**MALVACEAE**

73b Combination of characters not as above:

74a Leaves with or without stipules; stipules sometimes spiny, especially in succulent species; milky to reddish latex often present; inflorescences basically cymose, sometimes flowers in cyathia (*Euphorbia*); fruit often a 3-lobed capsule dehiscing septicidally into 3 bivalved cocci, often leaving a ± persistent axis; ovules typically with an obturator; seeds mostly with a micropylar caruncle ..... **EUPHORBIACEAE**

74b Leaves without stipules, or stipules small, or one stipule of a pair often placed much higher than the other, never spiny; plants not succulent; latex absent; flowers in racemes, narrow panicles or fascicles; fruit a drupe or capsule, sometimes bladdery or winged; ovules without an obturator; seeds without a caruncle but sometimes with an arillode:

75a Stamens 5–24, often 8; disc usually well-developed; fruit a drupe or capsule, sometimes bladdery or winged; seeds often with an arillode; ovules anatropous, hemitropous or campylotropous ..... **SAPINDACEAE**

75b Stamens 5, or 10 in 2 whorls of 5, alternately longer and shorter; disc usually small or absent; fruit drupaceous, eventually dehiscing by valves; seeds without an arillode; ovules orthotropous or anatropous ..... **PANDACEAE**

71b Flowers bisexual:

76a Anthers 1-thecous; stamens many, filaments ± united into a tube around the style; sepals valvate, with or without an epicalyx; plants often with stellate hairs ..... **MALVACEAE**

76b Anthers 2-thecous:

77a Styles 2 or more, sometimes fused towards base:

78a Herbs or low subshrubs; fruit of 2 hemispherical mericarps, often with a rough surface ..... **MOLLUGINACEAE**

78b Trees, shrubs or perennial scramblers; fruit a drupe or separating into 2 or 3 broadly winged mericarps:

79a Perennial scramblers, rarely shrubs with medifixed unicellular hairs; fruit separating into 2(3) broadly winged mericarps ..... **MALPIGHIACEAE**

79b Trees or shrubs, not scrambling, glabrous; fruit a drupe ..... **ERYTHROXYLACEAE**

77b Style 1:

80a Herbs or subshrubs; sepals and petals 4; stamens 6, tetradynamous (inner 4 long, outer 2 short); fruit an indehiscent, dehiscent or splitting capsule (silique/silicule) ..... **BRASSICACEAE**

80b Trees, shrubs or rhizomatous subshrubs; sepals and petals usually 5; stamens mostly more than 6:

81a Petals and stamens perigynous, arising at mouth of calyx tube; ovary fused on one side to calyx tube ..... **CHRYSOBALANACEAE**

81b Petals and stamens hypogynous; ovary free from calyx:

82a Carpels ± free:

83a Leaves penninerved, mostly glabrous ..... **OCHNACEAE**

83b Leaves palmatinerved, with dense stellate hairs ..... **Brownlowioideae—MALVACEAE**

82b Carpels fused into a 5-locular ovary:

84a Stipules minute; anthers with disjunct thecae containing only 1 pollen sac and attached to lower portion of a thick fleshy, ovate-acuminate connective, dehiscing by detachment ..... **HUMIRIACEAE**

84b Stipules large, very long, folded around the terminal bud and leaving a distinct scar around stem; anthers 2-thecous, opening by longitudinal slits ..... **IRVINGIACEAE**

70b Ovary with 2 or more ovules in each locule:

85a Stamens as many as or fewer than petals:

86a Ovules many in each locule; flowers in axillary pedunculate umbels; trees or shrubs ..... **BREXIACEAE**

86b Ovules 2 in each locule:

87a Ovary 5-locular:

88a Petals imbricate; leaves lobed or divided; ovary and fruit beaked; herbs or shrublets ..... **GERANIACEAE**

88b Petals contorted; leaves simple, entire; ovary and fruit without a stout central axis:

89a Herbs; petals not persistent; styles 5 ..... **LINACEAE**

89b Trees or shrubs; petals persistent; style 1 ..... **IXONANTHACEAE**

87b Ovary 2–4-locular:

90a Petals 2-lobed or 2-fid; fruit a drupe; leaves entire ..... **DICHAPETALACEAE**

90b Petals not 2-lobed:

91a Flowers unisexual; styles 2 or 3, free or united at base, often lobed or branched ..... **EUPHORBIACEAE**

91b Flowers bisexual; style 1 ..... **CELASTRACEAE**

85b Stamens more numerous than petals:

92a Leaves without stipules, or stipules minute and early caducous:

93a Filaments ± united into a tube ..... **MELIACEAE**

93b Filaments free or united only at base:

94a Leaves dotted with translucent glands ..... **RUTACEAE**

94b Leaves without translucent glands:

95a Herbs with tubers or a woody rootstock ..... **OXALIDACEAE**

95b Trees, shrubs, or climbers:

96a Petals 12–16, valvate in bud, opening irregularly in 6 or 7 lobes free or joined at base; stamens ± 50 ..... **SCYTOPETALACEAE**

96b Petals 4 or 5(6); stamens fewer than 20, or if more, then aggregated into fascicles or clusters:

97a Trees or shrubs, secreting resin; bark often peeling or flaking; stamens 8(4), arising on a disc; ovary 2-locular with 2 ovules per locule ..... **BURSERACEAE**

97b Trees, shrubs or woody climbers without resin and without peeling bark; stamens 9–many:

98a Stamens 9–13, borne at apex of a stout gynophore; ovary 4- or 5-locular with many axile ovules; style 1, 4- or 5-fid at apex ..... **PENTADIPLANDRACEAE**

98b Stamens many, aggregated into fascicles or clusters, free or adnate to corolla base; styles 5 or 6, free with papillose stigmas ..... **THEACEAE**

92b Leaves with stipules:

99a Sepals imbricate; plants without stellate hairs; ovary 5-locular with 2 ovules in each locule:
100a Petals imbricate; ovary beaked, with a 5-branched style; herbs or shrublets ..... **GERANIACEAE**
100b Petals contorted; ovary without a stout central axis, with 5 free styles: trees or shrubs, sometimes climbing ..... **LINACEAE**
99b Sepals (or calyx lobes) valvate; plants often with stellate hairs:
101a Filaments free or almost so; trees, shrubs or herbs ..... **Grewioideae, Helicteroideae—MALVACEAE**
101b Filaments ± united into a tube or into groups of 2 or 3:
102a Anthers 2-thecous; trees or shrubs ..... **Dombeyoideae—MALVACEAE**
102b Anthers 1-thecous; herbs, shrubs or sometimes trees ..... **Malvoideae—MALVACEAE**

GROUP 9 (*Placentation axile, basal or apical; ovary superior; petals ± united*)

1a Ovary 1-locular, sometimes septate towards base:
2a Flowers unisexual; plants dioecious; male flowers with united petals, female flowers with 1–4 free petals; stamens united into a synandrium; leaf blades peltate or subpeltate; woody climbers. ..... **MENISPERMACEAE**
2b Flowers bisexual; stamens free or with united filaments:
3a Ovary with 1 ovule:
4a Flowers irregular, papilionaceous, lowermost 2 petals united and forming a keel; stamens 10, diadelphous: uppermost 1 free, other 9 with ± united filaments; herbs ..... **FABACEAE**
4b Flowers regular; stamens not diadelphous:
5a Sepals 2; petals united only near base; ± succulent twining herbs or stout shrubs:
6a Leaves alternate; perennials with twining stems ..... **BASELLACEAE**
6b Leaves opposite; succulent shrubs with stout, sometimes waxy branches ..... **PORTULACACEAE**
5b Sepals more than 2:
7a Stamens arising on elongated calyx tube, usually twice as many as calyx lobes; corolla ring-like, arising at mouth of calyx tube; ovule pendulous from apex of ovary; shrubs, sometimes climbing ..... **THYMELAEACEAE**
7b Stamens not arising on calyx, as many as calyx lobes; corolla 4- or 5-lobed. not ring-like; ovule arising from base of ovary:
8a Leaves alternate; stamens opposite petals; calyx covered with stalked glands; herbs or shrubs, sometimes climbing .. **PLUMBAGINACEAE**
8b Leaves opposite; stamens alternating with petals; calyx without stalked glands; shrubs or trees ..... **SALVADORACEAE**
3b Ovary with 2 or more ovules:
9a Stamens fewer than petals; flowers ± irregular; herbs, often aquatic:
10a Stamens 2; corolla strongly irregular, tube spurred; leaves undivided or much divided and often bearing insectivorous bladders ..... **LENTIBULARIACEAE**
10b Stamens 4; corolla only slightly irregular, tube not spurred; leaves undivided, without bladders ..... **SCROPHULARIACEAE**
9b Stamens as many as petals; flowers regular or almost so:
11a Stamens opposite petals:
12a Trees, shrubs or lianes; fruit indehiscent, usually 1-seeded; leaves alternate ..... **MYRSINACEAE**
12b Herbs; fruit a many-seeded circumscissile or 5-valved capsule, or sometimes 1-seeded and indehiscent; leaves opposite or alternate ..... **PRIMULACEAE**
11b Stamens alternating with petals; trees or shrubs:
13a Leaves opposite:
14a Shrubs or woody climbers with milky sap ..... **APOCYNACEAE**
14b Trees or shrubs, sometimes mangroves, sometimes leaves with 5(7) major veins from near the base:
15a Leaves with 1 major vein from the base; mangroves ..... **AVICENNIACEAE**
15b Leaves with 5(7) major veins from near the base; savanna trees ..... **STRYCHNACEAE**
13b Leaves alternate; stamens 5 or 10 or more; ovules 2 or 10 or more:
16a Trees, shrubs or lianas; sepals (3)4 or 5; stamens 5; fruit a drupe ..... **ICACINACEAE**
16b Subshrubs or perennial herbs, often with fleshy leaves; sepals 2; stamens 10 or more; fruit a chartaceous capsule ..... **PORTULACACEAE**

1b Ovary 2- or more-locular:
17a Petals 10 or more:
18a Styles/stigmas 5; fruit a 5-valved capsule; herbs with fleshy leaves ..... **MESEMBRYANTHEMACEAE**
18b Style 1; fruit a berry; trees or shrubs, sometimes climbing:
19a Stamens ± 50; petals (probably petaloid corona lobes) opening irregularly ..... **SCYTOPETALACEAE**
19b Stamens mostly fewer than 20; petals opening regularly in 1–3 whorls:
20a Petals in 2 or 3 whorls, imbricate; stamens twice as many as inner petals, or as many as and opposite inner petals and alternating with staminodes; ovary with 1 ovule in each locule; leaves alternate ..... **SAPOTACEAE**
20b Petals in 1 whorl, imbricate; stamens 2; ovary with 4 or 5 ovules in each locule ..... **OLEACEAE**
17b Petals fewer than 10:
21a Stamens more numerous than petals:
22a Leaves with stipules, often digitate or palmately lobed; flowers unisexual; trees, shrubs or herbs ..... **EUPHORBIACEAE**
22b Leaves without stipules, or stipules minute and early caducous:

23a Flowers irregular, lowest (median) petal forming a keel; filaments united into a sheath split on upper side; ovary 2-locular with 1 ovule in each locule; herbs or shrubs ..... **POLYGALACEAE**

23b Flowers regular; filaments not united into a sheath but sometimes united at base; trees or shrubs:

24a Ovary with 1 or 2 ovules in each locule; fruit indehiscent, baccate; flowers bisexual or unisexual ..... **EBENACEAE**

24b Ovary with several or many ovules in each locule; fruit a loculicidal capsule or a drupe:

25a Stamens 10 or fewer; plants often heath-like ..... **ERICACEAE**

25b Stamens ± 50; glabrous trees ..... **SCYTOPETALACEAE**

21b Stamens as many as or fewer than petals:

26a Stamens fewer than petals: 2–4:

27a Ovary with more than 4 ovules in each locule; flowers mostly irregular:

28a Leaves pinnate, opposite or ternate; stamens 4; fruit a loculicidal capsule with winged seeds; trees or shrubs, sometimes climbing ..... **BIGNONIACEAE**

28b Leaves simple, sometimes deeply divided or reduced to scales:

29a Ovary completely or incompletely 4-chambered, each of 2 original locules becoming divided into 2 by a false septum; stamens 4; herbs or sometimes shrubs with mucilaginous glands ..... **PEDALIACEAE**

29b Ovary 2-locular, locules not becoming divided by false septa:

30a Ovules arranged in more than 2 series on each placenta; stamens 4 or 2; fruit a capsule or sometimes a berry, seeds not borne on hardened hook-like funicles; leaves alternate or opposite or whorled, sometimes reduced to scales; herbs or shrubs or sometimes trees ..... **SCROPHULARIACEAE**

30b Ovules arranged in 1 or 2 series on each placenta:

31a Fruit a club-shaped to ellipsoidal, loculicidally, often explosively dehiscent capsule, with seeds mostly borne on hard, hygroscopic, hook-like funicles; leaves opposite, mostly entire; herbs, shrubs or small trees ..... **ACANTHACEAE**

31b Fruit indehiscent or tardily dehiscent, armed with horns bearing recurved spines; flowers irregular, medium-sized, variously coloured, adaxially often gibbous, usually solitary, axillary; herbs, rarely shrubs or small trees ..... **PEDALIACEAE**

27b Ovary with 1–4 ovules in each locule:

32a Stamens 3; peduncles adnate to petioles of subtending leaves; trees or shrubs with alternate leaves ..... **DICHAPETALACEAE**

32b Stamens 4 or 2; peduncles not adnate to leaves:

33a Perianth regular; stamens 2; leaves opposite or sometimes ternate or alternate; trees or shrubs, sometimes climbing ... **OLEACEAE**

33b Perianth irregular:

34a Ovary ± deeply 4-lobed, style gynobasic; fruit separating into 4 nutlets (or fewer by abortion); leaves simple, opposite or whorled or sometimes alternate; herbs or shrubs, often aromatic ..... **LAMIACEAE**

34b Ovary not deeply 4-lobed, style not gynobasic:

35a Fruit a capsule, loculicidally dehiscent or sometimes failing to dehisce; seeds often borne on hardened, hook-like funicles; ovary 2-locular with 2–4 ovules in each locule; herbs or shrubs with opposite, simple leaves .. **ACANTHACEAE**

35b Fruit separating into 2 or more pyrenes or cocci, or a capsule, but then seeds not borne on hardened hook-like funicles:

36a Flowers solitary, axillary; fruit indehiscent, armed with 2 or 4 spines, or longitudinally 4-winged; stamens 4; leaves opposite or subopposite, often toothed or pinnately lobed; herbs with mucilaginous glands ..... **PEDALIACEAE**

36b Flowers grouped in inflorescences; fruit without spines or wings:

37a Anthers 1-thecous; leaves mostly alternate, simple, narrow; ovary 2-locular with 1 apical, pendulous ovule in each locule; herbs or shrubs ..... **SCROPHULARIACEAE**

37b Anthers 2-thecous; sometimes confluent; ovary 2–4(8)-locular with 1 basal or axile ovule in each locule; leaves opposite or whorled, simple, sometimes lobed or dissected ..... **VERBENACEAE**

26b Stamens as many as petals: 4 or more:

38a Leaves absent or reduced to scales:

39a Slender, twining, parasitic plants; ovary with 2 ovules in each locule; fruit a capsule; corolla with or without infrastaminal scales (*Cuscuta*) ..... **CONVOLVULACEAE**

39b Shrubs or succulent plants, not parasitic; ovary with many ovules in each locule; fruit formed of 2 separate follicular carpels (or 1 by abortion); flowers with corona ..... **APOCYNACEAE**

38b Leaves present, well-developed:

40a Stamens opposite petals, sometimes with staminodes; trees or shrubs with alternate leaves:

41a Leaves simple, entire; corolla lobes imbricate; stamens sometimes alternating with staminodes ..... **SAPOTACEAE**

41b Leaves 2-pinnate; corolla lobes valvate; stamens not accompanied by staminodes, filaments united into a tube ..... **LEEACEAE**

40b Stamens alternating with petals, sometimes partly connate:

42a Leaves opposite or whorled, sometimes in opposite or subopposite fascicles on small cushions, not all radical:

43a Stamens hypogynous, not arising on corolla; anthers opening by apical slits; heath-like shrubs ..... **ERICACEAE**

43b Stamens arising on corolla tube or variously joined with gynoecium:

44a Petals imbricate in bud:

45a Ovary with 1 or 2 ovules in each locule; fruit drupaceous, or separating into pyrenes or nutlets, or a loculicidal capsule:

46a Petals and stamens 4; herbs, shrubs or trees ..... **VERBENACEAE**

46b Petals and stamens 5:

47a Herbs, often with bulbous-based hairs; fruit drupaceous or separating into pyrenes or nutlets; flowers all similar ..... **BORAGINACEAE**

47b Shrubs, undershrubs or lianes, glabrous or with simple hairs; fruit a loculicidal capsule; flowers dimorphic ... . **GELSEMIACEAE**

45b Ovary with several to many ovules in each locule; fruit a septicidal capsule, sometimes a berry:

48a Petals and stamens 5 or more; leaves pinnately compound, or simple and then rigid spiny shrubs with solitary or paired flowers ..... **BIGNONIACEAE**

48b Petals and stamens 4; herbs, subshrubs, shrubs or trees, not spiny, and if shrubs, flowers not solitary or paired:

49a Herbs; flowers solitary or paired in leaf axils ..... **SCROPHULARIACEAE**

49b Trees, shrubs or subshrubs; flowers in cymes, racemes or panicles ..... **BUDDLEJACEAE**

44b Petals contorted or valvate:

50a Petals valvate; leaves usually with 3 major veins from base; fruit a berry, often large, globose and with a woody rind ..... **STRYCHNACEAE**

50b Petals contorted:

51a Herbs with septicidal capsules or rarely trees with berries ..... **GENTIANACEAE**

51b Herbs, often succulent, shrubs or trees, often with milky latex; flowers often with corona; fruit mostly a pair of follicular mericarps ..... **APOCYNACEAE**

42b Leaves (at least lower ones) alternate, sometimes all radical:

52a Leaves all radical; flowers small, in pedunculate spikes or heads; fruit a circumscissile capsule; herbs ..... **PLANTAGINACEAE**

52b Leaves not all radical:

53a Ovary with more than 2 ovules in each locule:

54a Petals contorted; fruit formed of 2 follicular mericarps; shrubs or trees ..... **APOCYNACEAE**

54b Petals not contorted; fruit a capsule or berry:

55a Styles 2 or 3; petals imbricate; fruit a capsule; herbs ..... **HYDROPHYLLACEAE**

55b Style 1:

56a Petals plicate or valvate; herbs, shrubs or trees ..... **SOLANACEAE**

56b Petals imbricate:

57a Fruit a capsule with winged seeds; leaves simple or 3-foliolate; spiny shrubs ..... **BIGNONIACEAE**

57b Fruit a berry or capsule, seeds unwinged; leaves simple; herbs or spiny shrubs ..... **SOLANACEAE**

53b Ovary with 1 or 2 ovules in each locule:

58a Filaments united into a sheath split on upper side; flowers irregular, lowest (median) corolla lobe forming a keel; fruit drupaceous; shrubs or trees ..... **POLYGALACEAE**

58b Filaments not united into a sheath:

59a Corolla tube split down front, with 4 lobes; anthers 1-thecous; ovary 2-locular with 1 apical, pendulous ovule in each locule; herbs or shrublets with spicate flowers ..... **SCROPHULARIACEAE**

59b Corolla tube not split; anthers 2-thecous:

60a Style absent; stigma sessile; flowers unisexual; fruit a globose berry ..... **AQUIFOLIACEAE**

60b Style(s) present, terminal or gynobasic; flowers bisexual; fruit a schizocarp or drupaceous or a capsule, rarely indehiscent:

61a Fruit a schizocarp of 4 (rarely 2) nutlets, or drupaceous with 4 (rarely 2) 1-seeded stones; petals imbricate or contorted in bud ..... **BORAGINACEAE**

61b Fruit a capsule or indehiscent; petals convolute, folded and valvate in bud; plants often twining or trailing ..... **CONVOLVULACEAE**

GROUP 10 (*Placentation axile, basal or apical; ovary inferior; petals absent*)

1a Parasitic plants: either low, ± fleshy, ± leafless and growing on roots of woody plants, or shrublets growing on trees or shrubs:

2a Shrublets growing on other trees or shrubs ..... **VISCACEAE**

2b Low, ± fleshy, ± leafless root parasites:

3a Flowers unisexual, in many-flowered inflorescences; leaves scale-like; ovule 1 ..... **BALANOPHORACEAE**

3b Flowers usually bisexual, solitary, with a tubular 3- or 4(5)-lobed perianth resembling a fungus ..... **HYDNORACEAE**

1b Plants not parasitic:

4a Ovary 2- or more-locular:

5a Flowers unisexual, in heads, cymes or panicles; leaves with stipules:

6a Flowers in heads; stamens as many as sepals; ovary with 1 ovule in each locule; trees or shrubs with entire leaves ..... **HAMAMELIDACEAE**

6b Flowers in cymes or panicles; stamens many; ovary with very many ovules in each locule; sepals petaloid; herbs, sometimes epiphytic, with alternate, often unequal-sided leaves ..... **BEGONIACEAE**

5b Flowers bisexual, often solitary, less often in fascicles or clusters, cymes or rarely in spikes; leaves without stipules:

7a Leaves opposite; flowers solitary and subsessile in axils of leaves; herbs ..... **ONAGRACEAE**

7b Leaves alternate:

8a Trees (mangroves); stamens and staminodes very many, the outer series of staminodes fused and resembling a corolla ..... **LECYTHIDACEAE**

8b Herbs or shrubs; stamens, if many, without fused staminodes:

9a Perianth fused into an S-shaped to ± straight tube; usually twining or scrambling herbs or shrubs; fruit a capsule .....

..... **ARISTOLOCHIACEAE**

9b Perianth members free or fused only in the lower half; fruit a nut, often winged or spiny ..... **AIZOACEAE**

4b Ovary 1-locular:

10a Ovules 2 or more in the ovary:

11a Stamens twice as many as calyx lobes; trees, shrubs or scramblers; flowers in racemes, spikes or heads; fruit indehiscent, often with 2–5 longitudinal wings ..... **COMBRETACEAE**

11b Stamens as many as calyx lobes:

12a Ovules 2–4, pendulous from a free-central placenta; style 1 with an entire or divided stigma; flowers solitary or in cymes or racemes, bisexual or unisexual; herbs or shrubs, often parasitic on roots and sometimes with reduced leaves ..... **SANTALACEAE**

12b Ovules 4, pendulous from apex of ovary; styles 4; flowers clustered in axils of leaves, unisexual or plants polygamous; herbs, not parasitic ..... **HALORAGACEAE**

10b Ovule 1 in the ovary:

13a Herbs with large basal, long-petiolate, toothed, kidney-shaped leaves; flowers small, paniculate-spicate ..... **GUNNERACEAE**

13b Trees, shrubs or subshrubs:

14a Leaves opposite; perianth tube deeply urn-shaped; anthers opening by 2 valves ..... **LAURACEAE**

14b Leaves mostly alternate:

15a Flowers unisexual, small, enclosed in a syconium or 'fig', or implanted on a flat to top-shaped receptacle, in globose heads or catkins; often with milky or watery latex ..... **MORACEAE**

15b Flowers bisexual or unisexual, cymose in axils of upper leaves; latex absent; fruit a bony nut with long wings ..... **HERNANDIACEAE**

GROUP 11 (*Placentation axile, basal or apical; ovary inferior; petals free*)

1a Parasitic shrubs growing on other shrubs or trees; ovules scarcely distinguishable from surrounding tissue of ovary; calyx truncate or obsolete; stamens as many as and opposite petals and arising on them; leaves simple, entire, opposite or alternate, sometimes reduced to scales ..... **LORANTHACEAE**

1b Plants not parasitic; ovule or ovules clearly distinguishable within ovary:

2a Ovary 1-locular:

3a Trees or shrubs, sometimes climbing; style 1, unbranched:

4a Leaves alternate or scattered, ± ericoid; stamens 4 or 5; sepals, petals and stamens 4; flowers solitary, axillary ..... **CELASTRACEAE**

4b Leaves opposite, rarely alternate but then stamens more than 5, flat, sometimes with 3(5) main veins from base:

5a Leaves with 3(5) main veins from base; young branches usually 4-angled; fruit a ± globose berry; ovules 2–12 on central placenta ..... **MELASTOMATACEAE**

5b Leaves with 1 main vein from base; fruit usually indehiscent, dry or sometimes fleshy, often variously winged or ridged; ovules usually 2, pendulous ..... **COMBRETACEAE**

3b Herbs or subshrubs; styles or style branches 2–6:

6a Ovules many on basal placenta; sepals 2, often deciduous; fruit a circumscissile capsule ..... **PORTULACACEAE**

6b Ovule or ovules pendulous from apex of ovary or on pendulous, apical placentas; sepals or calyx lobes 2–5; fruit not circumscissile:

7a Ovules many on pendulous placentas; fruit a capsule dehiscing at apex; leaves opposite; flowers bisexual, in axillary pairs; petals and stamens 5 ..... **VAHLIACEAE**

7b Ovules 1–4, pendulous from apex of ovary; fruit indehiscent; leaves alternate or opposite, sometimes all radical; flowers bisexual or unisexual, paniculate-spicate or in axillary clusters:

8a Leaves small, sessile; flowers in axillary fascicles ..... **HALORAGACEAE**

8b Leaves large, on long petioles; flowers in terminal heads or compound spikes ..... **GUNNERACEAE**

2b Ovary 2- or more-locular:

9a Ovule 1 in each locule:

10a Stamens twice as many as petals:

11a Trees, shrubs or subshrubs; petals 5 ..... **ANISOPHYLLEACEAE**

11b Herbs; petals 2–4; stamens 4–8; ovary 1–4-locular:

12a Flowers small to minute, usually unisexual; aquatics or marsh plants ..... **HALORAGACEAE**

12b Flowers conspicuous with 4 usually sharply clawed petals ..... **ONAGRACEAE**

10b Stamens as many as petals:

13a Stamens opposite petals; shrubs, often climbing with tendrils; fruit often separating into cocci, sometimes winged ... **RHAMNACEAE**

13b Stamens alternating with petals; plants without tendrils:

14a Flowers solitary in axils of leaves; floating aquatic herbs; leaves alternate, rosulate, with ± inflated petiole; fruit large, indehiscent, with hard endocarp and armed with 2 or 4 horns ..... **TRAPACEAE**

14b Flowers grouped in inflorescences; plants not aquatic:

15a Fruit separating into 2 cocci; herbs, sometimes arborescent; flowers in simple or compound umbels, sometimes capitate; leaves often much divided or compound ..... **APIACEAE**

15b Fruit drupaceous or capsular, not separating into cocci; trees or shrubs:

16a Leaves pinnate or digitate or palmately divided; flowers in umbels or racemes or spikes; fruit drupaceous ... **ARALIACEAE**

16b Leaves simple, undivided:

17a Petals and stamens 4; fruit a drupe; leaves opposite, entire or toothed; flowers bisexual or unisexual, in panicles or umbel-like cymes ..... **CORNACEAE**

17b Petals and stamens 5; fruit a capsule; trees or shrubs ..... **HAMAMELIDACEAE**

9b Ovules 2 or more in each locule:
18a Leaves alternate:
19a Leaves with stipules, often unequal-sided; flowers unisexual; plants monoecious; stamens many; ovules very many in each locule; herbs, sometimes epiphytic ..... **BEGONIACEAE**
19b Leaves without stipules:
20a Style absent; stigmas as many as locules, subulate to filiform; leaves ± succulent ..... **MESEMBRYANTHEMACEAE**
20b Styles 1 or 2:
21a Styles 2; flowers unisexual or both bisexual and unisexual on same plant, in axillary panicles; stamens as many as petals; ovary 2-locular; shrubs ..... **ESCALLONIACEAE**
21b Style 1, with an entire or lobed stigma; flowers bisexual or sometimes both bisexual and unisexual on same plant:
22a Fruit a drupe; petals 2-fid or 2-lobed; leaves entire ..... **DICHAPETALACEAE**
22b Fruit a capsule:
23a Stamens as many or twice as many as petals:
24a Herbs or shrubs, sometimes aquatic; flowers bisexual ..... **ONAGRACEAE**
24b Shrubs or shrublets, dioecious; flowers small, male corymbose, female solitary ..... **MONTINIACEAE**
23b Stamens many, more than twice as many as petals; fruit a berry or drupe:
25a Flowers solitary or paired in axils of leaves; ovary 2-locular; leaves gland-dotted; shrublets ..... **MYRTACEAE**
25b Flowers in terminal racemes; ovary 4-locular; leaves not gland-dotted; mangroves ..... **LECYTHIDACEAE**
18b Leaves opposite:
26a Leaves fleshy and succulent ..... **MESEMBRYANTHEMACEAE**
26b Leaves not succulent:
27a Stamens as many as petals; petals alternating with incurved scales; trees or shrubs ..... **OLINIACEAE**
27b Stamens twice as many as petals or more numerous; petals not alternating with scales:
28a Stamens many, more than twice as many as petals; trees or shrubs with gland-dotted leaves; stipules absent or very small ..... **MYRTACEAE**
28b Stamens twice as many as petals, if more, then interpetiolar stipules present or a scar line if they have fallen:
29a Leaves with interpetiolar stipules; ovules 2 in each locule; viviparous mangroves, or forest trees or shrubs ..... **RHIZOPHORACEAE**
29b Leaves without stipules or stipules much reduced; ovules many in each locule; plants not viviparous:
30a Anthers opening by an apical pore; connective often appendaged below anther; leaves with 3 or more parallel, longitudinal nerves; seeds without tuft of hairs; herbs or shrubs or small trees ..... **MELASTOMATACEAE**
30b Anthers opening by longitudinal slits; connective unappendaged; leaves without parallel, longitudinal nerves; seeds often with an apical tuft of hairs; herbs ..... **ONAGRACEAE**

GROUP 12 (*Placentation axile, basal or apical; ovary inferior; petals ± united*)

1a Parasitic shrubs growing on other shrubs or trees; ovules scarcely distinguishable from surrounding tissue of ovary; calyx truncate or shortly lobed; stamens as many as and opposite corolla lobes and arising on them; leaves simple, entire, opposite or alternate, sometimes ternate ..... **LORANTHACEAE**
1b Plants not parasitic; ovule or ovules clearly distinguishable within ovary:
2a Ovary 1-locular:
3a Ovule 1; flowers regular or irregular, in involucrate heads; fruit indehiscent, often crowned by persistent calyx forming a pappus of bristles or scales:
4a Anthers united into tube surrounding style; ovule erect from base of ovary; herbs, shrubs or trees; corolla of outer (ray) flowers often differing from that of inner flowers ..... **ASTERACEAE**
4b Anthers free; ovule pendulous from apex of ovary; herbs with opposite leaves ..... **DIPSACACEAE**
3b Ovules many; flowers regular, not in involucrate heads:
5a Calyx composed of 2 often deciduous sepals; fruit a circumscissile capsule; stamens as many as and alternating with corolla lobes or more numerous; herbs ..... **PORTULACACEAE**
5b Calyx 4- or 5-lobed; fruit not circumscissile; stamens as many as and opposite corolla lobes:
6a Trees or shrubs; flowers in axillary panicles or racemes; fruit indehiscent, dry or fleshy ..... **MAESACEAE**
6b Herbs; flowers in terminal racemes; fruit a 5-valved capsule ..... **PRIMULACEAE**
2b Ovary 2- or more-locular (sometimes 3-locular with 1 fertile locule and 2 empty locules):
7a Petals united into a deciduous mass (calyptra); stamens very many; trees or shrubs with gland-dotted leaves ..... **MYRTACEAE**
7b Petals more or less united into a tube, not into a deciduous mass; stamens not more than twice as many as corolla lobes:
8a Ovary 3-locular with 2 empty locules, fertile locule with 1 apical, pendulous ovule; stamens 3; fruit indehiscent, often crowned by persistent calyx forming feathery pappus; herbs with opposite leaves ..... **VALERIANACEAE**
8b Ovary 2- or more-locular, usually without empty locules:
9a Trailing or climbing herbs or shrubs often with tendrils; flowers unisexual; stamens 3–5, anthers sometimes curved or flexuous or folded; leaves often palmately or pedately lobed or deeply divided ..... **CUCURBITACEAE**
9b Plants without tendrils; flowers bisexual or sometimes unisexual:
10a Leaves opposite or whorled, with interpetiolar or intrapetiolar (sometimes leaf-like) stipules and entire margin; trees, shrubs or herbs, sometimes climbing ..... **RUBIACEAE**
10b Leaves alternate or opposite, or spirally imbricate, without stipules, sometimes reduced to scales:

11a Stamens indefinite; leaves fleshy ..... **MESEMBRYANTHEMACEAE**
11b Stamens definite; leaves rarely succulent:
12a Stamens twice as many as corolla lobes; anthers opening by apical pores; flowers in axillary racemes; trees or shrubs with alternate leaves ..... **ERICACEAE**
12b Stamens as many as corolla lobes; anthers opening by longitudinal slits:
13a Fruit a drupe:
14a Ovary with 1 ovule in each locule; flowers irregular, corolla tube split down back; maritime shrubs or undershrubs ..... **GOODENIACEAE**
14b Ovary with 2 or more ovules in each locule; flowers ± regular; petals bifid or bilobed ..... **DICHAPETALACEAE**
13b Fruit a capsule:
15a Corolla lobes imbricate; capsule circumscissile; flowers regular, in terminal spikes; anthers free; hydrophytes ..... **SPHENOCLEACEAE**
15b Corolla lobes valvate; capsule dehiscing by valves; flowers regular or irregular with 1- or 2-lipped corolla; anthers free or cohering in a tube around the style ..... **CAMPANULACEAE**

KEY TO MONOCOTYLEDONS (pp. 375–458)

1a Flowers white or otherwise brightly coloured; perianth wholly or partly petal-like:
2a Ovary superior ..... **Group 1** (below)
2b Ovary inferior or half-inferior ..... **Group 2** (p. 24)
1b Flowers with perianth absent or papery, glumaeeous to hyaline or sometimes herbaceous, or reduced to hairs or scales:
3a Aquatie herbs, free-floating or submerged ..... **Group 3** (p. 24)
3b Land plants, sometimes rooting in water:
4a Flowers (florets) arranged in small spikes (spikelets) subtended or enclosed by bracts; grasses or grass-like plants ..... **Group 4** (p. 25)
4b Flowers not arranged in spikelets ..... **Group 5** (p. 25)

GROUP 1 (*Flowers white or otherwise brightly coloured; perianth wholly or partly petal-like; ovary superior*)

1a Aquatic or marsh herbs:
2a Perianth of 6 petal-like tepals in 2 whorls, blue, white or yellow; gynoecium with an ovary of 3 fused carpels ..... **PONTEDERIACEAE**
2b Perianth of 3 coloured sepals or tepals, often accompanied by 3 herbaceous sepals; gynoecium composed of either 2–many ± free carpels or of 3 fused carpels forming a 1-locular ovary:
3a Flowers solitary on long axillary pedicels; gynoecium with a 1-locular ovary of 3 fused carpels ..... **MAYACACEAE**
3b Flowers whorled or in simple or 2-branched spikes or in simple to compound umbels; gynoecium of 2–many ± free carpels:
4a Flowers in a simple or 2-branched spike; perianth in a single whorl of 1–3 white to pink tepals ..... **APONOGETONACEAE**
4b Flowers whorled or in simple or compound umbels; plants often with white sap:
5a Carpels each with 1 basal ovule; fruit of 3–many achenes ..... **ALISMATACEAE**
5b Carpels each with many ovules on a parietal/marginal placenta; fruit a head of follicles ..... **LIMNOCHARITACEAE**
1b Land plants, sometimes rooting in water:
6a Perianth composed of separate calyx and corolla, the calyx usually herbaceous:
7a Style simple; ovary 2- or 3-locular; flowers in open to congested cymes, with conspicuous corolla often blue or yellow, often subtended by folded or boat-shaped bracts ..... **COMMELINACEAE**
7a Style branched; ovary 1–3-locular; flowers small, crowded in bracteate heads or spikes on long, leafless peduncles:
8a Flowers unisexual; corolla inconspicuous to minute; ovary 3- or 2-locular ..... **ERIOCAULACEAE**
8b Flowers bisexual; petals mostly yellow to white; ovary 1-locular ..... **XYRIDACEAE**
6b Perianth composed of similar or subsimilar tepals, all petal-like:
9a Anthers dehiscing by an apical pore, often unequal; filaments short, without a swelling below the anther, arising at mouth of perianth tube; rootstock a corm ..... **TECOPHILAEACEAE**
9b Anthers dehiscing by longitudinal slits (these rarely very short but then plants rhizomatous and filaments with a swelling below the anther); rootstock a rhizome, bulb or tuber:
10a Fruit a fleshy berry or drupe:
11a Leaves with 2 basal tendrils; flowers unisexual; plants dioecious ..... **SMILACACEAE**
11b Leaves without basal tendrils; flowers bisexual:
12a Leaf tips narrowing into a coiled tendril ..... **FLAGELLARIACEAE**
12b Leaf tips not as above:
13a Flowers longer than 20 mm, tubular below, with exserted stamens, crowded in dense racemes or panicles; leaves large, tough and crowded; plants rhizomatous or tree-like ..... **DRACAENACEAE**
13b Flowers up to 10 mm long, in axillary or terminal racemes, panicles or cymes; plants herbaceous, shrubby or scandent:
14a Leaves reduced to scales with a spiny or soft spur; cladodes needle-shaped or leaf-like and without distinct cross-connections between parallel veins ..... **ASPARAGACEAE** (in narrow sense)
14b Leaves developed, with many prominent parallel veins, often with distinct cross-connections:
15a Tepals fused into a short broad tube; scandent climbers or subshrubs; leaves not sheathing at base, not equitant ..... (Luzuriagaceae) **BEHNIACEAE**

15b Tepals free, spreading; filaments with a swelling below the anther; stem erect, usually unbranched; leaves sheathing at base and ± equitant ..... **HEMEROCALLIDACEAE**

10b Fruit a capsule:

16a Flowers in umbels subtended by 2 spathaceous bracts and borne on naked peduncles; plants usually smelling of onion or garlic; rootstock a bulb or rhizome ..... **ALLIACEAE**

16b Flowers in spikes or racemes:

17a Rootstock a bulb; flowers borne on naked peduncles ..... **HYACINTHACEAE**

17b Rootstock a rhizome, corm or tuber:

18a Seeds woolly; flowering stems leafless except for a clasping basal leafy bract; leaves petiolate, often absent at flowering; rootstock a tuber ..... (Convallariaceae in part) **ERIOSPERMACEAE**

18b Seeds glabrous; flowering stems leafy:

19a Rootstock a corm, rarely a tuber; seeds brown; flowers usually opposite the bracts ..... **COLCHICACEAE**

19b Rootstock a rhizome, sometimes short and with swollen roots; seeds black; flowers in axils of bracts:

20a Flowers borne singly in axils of bracts ..... **ASPHODELACEAE**

20b Flowers more than 1 in axils of bracts ..... (including Hemerocallidaceae in part) **ANTHERICACEAE**

GROUP 2 (*Flowers white or otherwise brightly coloured; perianth wholly or partly petal-like; ovary inferior or half-inferior*)

1a Submerged aquatics rooting from a rhizome; flowers mostly unisexual, submerged or floating ..... **HYDROCHARITACEAE**

1b Terrestrial plants or emergent aquatics, but then rootstock cormous and stamens 6:

2a Fertile stamens 5(6) or 1, but then supported by and not fused to the style; leaves pseudopetiolate with a broad base, midrib prominent and secondary veins pinnate-parallel:

3a Fertile stamen 1:

4a Outer tepals/sepals free; anther 1-thecous; ovary 1–3-locular with 1 ovule in each fertile locule ..... **MARANTACEAE**

4b Outer tepals/sepals united into a tube; anther 2-thecous; ovary 2- or 3-locular, usually with many ovules per locule:

5a Leaves distichous, usually with open sheaths; aerial parts aromatic ..... **ZINGIBERACEAE**

5b Leaves spirally arranged, with closed sheaths; aerial parts not aromatic ..... **COSTACEAE**

3b Fertile stamens 5(6):

6a Flowers unisexual, upper 5 tepals fused below; leaves spirally arranged; stems not woody, drying after fruiting, sometimes suckering; fruit a banana with seeds embedded in pith ..... **MUSACEAE**

6b Flowers bisexual, lateral inner tepals fused and enclosing style and stamens; leaves distichous; stems and rootstock perennial; seeds pea-like with a tuft of hairs ..... **STRELITZIACEAE**

2b Fertile stamens 3(4)6 or 1, but then fused to the style into a complex columnar structure; leaf venation never pinnate-parallel:

7a Stamen 1, united with style into a column (gynostemium); pollen agglutinated into masses (pollinia); upper or lower median tepal often elaborated and spurred ..... **ORCHIDACEAE**

7b Stamens 3(4) or 6; pollen not agglutinated into masses:

8a Flowers unisexual, in spikes or racemes; climbers with ± heart-shaped leaves ..... **DIOSCOREACEAE**

8b Flowers bisexual:

9a Leaves deeply divided with pinnatipartite segments, radical; flowers in bracteate umbels, the outer bracts broad, the inner long and thread-like; herbs with a tuberous rootstock ..... **TACCACEAE**

9b Leaves simple and undivided or sometimes absent:

10a Stamens 3, opposite outer tepals; leaves mostly unifacial; rootstock a corm or rhizome ..... **IRIDACEAE**

10b Stamens 6 or 3, but then opposite inner tepals:

11a Inflorescence apparently an umbel (sometimes 1-flowered), subtended by 1 or more spathaceous bracts and borne on a naked scape; rootstock a bulb or rhizome ..... **AMARYLLIDACEAE**

11b Inflorescence a corymb, raceme, panicle, cyme or 1-flowered, not subtended by spathaceous bracts; rootstock a corm or rhizome (rarely reduced):

12a Small saprophytic herbs with a few narrow basal leaves, or leaves scale-like ..... **BURMANNIACEAE**

12b Photosynthetic plants with well-developed leaves:

13a Robust, rosulate plants with tree-like inflorescences and large, spine-tipped, leathery or succulent leaves persisting for several years ..... ***AGAVACEAE**

13b Smaller plants, often coarsely hairy; leaves never spine-tipped:

14a Flowers many, in helicoid cymes borne on bracteate stalks; ovules 1 or 2 per locule:

14b Flowers mostly solitary or few borne on leafless scapes or pedicels; ovules many per locule:

15a Shrublets or short-stemmed perennials; leaves fibrous, abscising below, persistent bases stiffly fibrous and closely imbricate; flowers solitary, purple to mauve or white, with septal nectaries; seeds white to yellowish ..... **VELLOZIACEAE**

15b Acaulescent perennials; leaves softer, decaying irregularly, bases loosely fibrous and not regularly imbricate; flowers 1 to many, yellow, white, pink to red, without nectaries; seeds black ..... **HYPOXIDACEAE**

GROUP 3 (*Aquatic herbs, free-floating or submerged (flowers sometimes emergent); perianth absent or cupular or scale-like to well-developed*)

1a Plants floating freely on the surface, though sometimes attached to the substrate in very shallow water:

2a Small, ± disc-shaped to globular annuals not differentiated into stems and leaves; flowers borne in pouches or sheaths ..... (including Lemnaceae) **ARACEAE**

2b Rosette-forming, stoloniferous herbs with oblong, hairy leaves; flowers borne on a small spadix surrounded by a tubular spathe (**Pistia*) ..... **ARACEAE**

1b Plants rooted or freely suspended with leaves submerged or floating:

3a Gynoecium composed of 2 or more free carpels with separate styles and stigmas:

4a Perianth absent or cupular; stamens 1 or 2:

5a Flowers bisexual, in spikes above water at anthesis, spikes consisting of 2 naked flowers facing in opposite directions and borne at different heights; carpels 4–8, becoming stipitate in fruit and appearing umbellate; stamens 2, free ..... **RUPPIACEAE**

5b Flowers unisexual, submerged, axillary, cymose or solitary; carpels 1–9, stipitate; stamens 1 or 2, united:

6a Marine plants, dioecious; pollen filamentose ..... **CYMODOCEACEAE**

6b Brackish or freshwater plants, monoecious; pollen globose ..... **ZANNICHELLIACEAE**

4b Perianth present, composed of 1–4 free tepals; stamens 3–many:

7a Leaves borne on elongated stems; tepals usually 4; inflorescence a simple spike not enclosed in a spathe when young ..... **POTAMOGETONACEAE**

7b Leaves all basal; tepals 1–3; inflorescence a 2-branched or simple spike at first enclosed in a spathe:

8a Flowers in a 2-branched or simple spike on an elongated axillary peduncle at first enclosed in a spathe; flowers without bracts ..... **APONOGETONACEAE**

8b Flowers whorled or in simple or compound umbels; plants often with white sap:

9a Carpels each with 1 basal ovule; fruit of 3–many achenes ..... **ALISMATACEAE**

9b Carpels each with many ovules on a parietal placenta; fruit a head of follicles ..... **LIMNOCHARITACEAE**

3b Gynoecium composed of 1 carpel or of 2 or more united carpels with free or united styles:

10a Perianth present; ovary inferior, 1-locular with many ovules on parietal placentas; flowers mostly unisexual, submerged in marine species, exserted during anthesis in others; male flowers sometimes becoming detached and free-floating ..... **HYDROCHARITACEAE**

10b Perianth absent; ovary superior, with a solitary ovule:

11a Leaves opposite or verticillate, often toothed; flowers solitary or few together in leaf axils; freshwater plants ..... **NAJADACEAE**

11b Leaves alternate; inflorescence a spike of alternating male and female flowers enclosed in a spathe; marine plants ..... **ZOSTERACEAE**

GROUP 4 (*Flowers (florets) arranged in small spikes (spikelets) subtended or enclosed by bracts; grasses and grass-like plants*)

1a Leaves reduced to sheaths with free margins; plants dioecious; florets with a perianth of 6 tepals in 2 whorls ..... **RESTIONACEAE**

1b Leaves usually with a well-developed blade and a sheathing base; plants very rarely dioecious; florets mostly with 2–6 scale-like bracts or bristles:

2a Leaves 2-ranked; leaf sheaths usually with free, overlapping margins; stems terete or compressed, usually with hollow internodes; style branches and stigmas usually 2, feathery; anthers deeply sagittate and therefore appearing dorsifixed ..... **POACEAE**

2b Leaves often 3-ranked, mostly crowded in a basal tuft; leaf sheaths usually closed; stems often 3-angled, with solid internodes; style branches and stigmas 2 or 3, not feathery; anthers basifixed ..... **CYPERACEAE**

GROUP 5 (*Land plants, sometimes rooting in water; perianth glumaceous to hyaline, or sometimes herbaceous, or reduced to bristles or scales or absent*)

1a Leaves pinnately or palmately compound; palms ..... **ARECACEAE**

1b Leaves simple:

2a Palm-like dioecious trees with coriaceous, linear-ensiform leaves, often longer than 1 m, arising from apex of stem in 3 spiralling ranks ..... **PANDANACEAE**

2b Herbaceous plants:

3a Inflorescence a very dense cylindric spike with female florets below and male ones above; perianth segments reduced to bristles .. **TYPHACEAE**

3b Inflorescence various, not as above:

4a Inflorescence a dense fleshy spike (spadix) subtended by a conspicuous, variously coloured spathe ..... **ARACEAE**

4b Inflorescence various, not a spadix:

5a Perianth segments herbaceous; fruit separating into 3 cocci; leaves radical ..... **JUNCAGINACEAE**

5b Perianth segments dry and glumaceous to hyaline; leaves basal, cauline or reduced to sheaths; plants often rush-like:

6a Tufted herbs with radical leaves and small to minute flowers crowded in terminal, compact, head-like inflorescences borne on naked peduncles:

7a Flowers unisexual; ovary 3- or 2-locular ..... **ERIOCAULACEAE**

7b Flowers bisexual; ovary 1-locular ..... **XYRIDACEAE**

6b Combination of characters not as above:

8a Leaves reduced to sheaths; flowers unisexual, sexes on separate plants; ovary 1- or 3-locular with 1 ovule per locule .... **RESTIONACEAE**

8b Leaves with blades; flowers bisexual; ovary ± 3-locular with many ovules per locule ..... **JUNCACEAE**

GYMNOSPERMS

Cupressaceae
(Pinopsida)
(Coniferales)

Glen, H.F. in Leistner: 29 (2000); Quinn *et al.* 513 (2002).

Sthn trop. Afr.: genera 3, species 4.

Coates Palgrave (2002) notes that **Callitris endlicheri* (Parl.) F.M.Bailey, the Black Cypress from SE Australia, has escaped from forest plantations in moister parts of Zimbabwe and has become established in woodland and eucalyptus plantations.

*Cupressus L.

Coates Palgrave: 90 (2002).

**Cupressus lusitanica* Mill., originally introduced from central America for timber, has escaped in eastern Zimbabwe.

Juniperus L.

Lewis: 88 (1960); Farjon: 267 (1992); White *et al.*: 80 (2001); Coates Palgrave: 91 (2002); Mapaura & Timberlake: 164 (2002); Msekandiana & Mlangeni: 35 (2002).

Sthn trop. Afr. 1: *Juniperus procera* Hochst. ex Endl., Zimbabwe, Malawi.

Widdringtonia Endl.

Lewis: 86 (1960); Silva: 41 (1983); Page: 309 (1990); Pauw & Linder: 297 (1997); White *et al.*: 82 (2001); Coates Palgrave: 91 (2002); Msekandiana & Mlangeni: 35 (2002).

Sthn trop. Afr. 2, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.

Cycadaceae
(Cycadopsida)
(Cycadales)

Palm-like, rarely branched trees, up to 9 m high; trunk bearing spirally arranged, woody leaf bases and scale leaves, and crowned by a tuft of leaves. **Leaves** arranged in close spirals, pinnately compound, long; leaflets falcate, very narrowly lanceolate, entire, with 1 thick midrib and no lateral veins. **Male scales** (sporophylls) leathery, up to 50 mm long, arranged in apical, very narrowly ovoid cones, each scale with many pollen sacs, in groups of 3–5, on abaxial surface. **Female sporophylls** frond-like, up to 0.3 m long, lanceolate or narrowly ovate, irregularly dentate, thickened fertile central axis bearing 4 or 5 pairs of sessile marginal ovules, not forming a definite cone but spirally arranged in a densely crowded apical whorl. **Seeds** ovoid, ± 40 mm in diameter at maturity.

Genus 1, species 17, E Africa to Japan and Australia: sthn trop. Afr. species 1.

Cycas L.

Prain: 344 (1917); Lewis: 79 (1960); Silva: 5 (1983); Goode: 20 (1989); Johnson & Wilson: 370 (1990); De Laubenfels & Adema: 351 (1998); Goode: 303 (2001); Coates Palgrave: 74 (2002); Grobbelaar: 113 (2002).

Description as for family.

Species 17, E Africa to Japan and Australia; sthn trop. Afr. 1: *Cycas thouarsii* Gaudich., Mozambique.

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PRAIN, D. 1917. Cycadaceae. *Flora of tropical Africa* 6(2): 344–354.

SILVA, M. DA GRAÇA. 1983. Cycadaceae. *Flora de Moçambique* 1: 5–33.

Gnetaceae
(Gnetopsida)
(Gnetales)

Dioecious, large-leaved, evergreen, loosely twining, remotely branched lianes; branches opposite or sometimes in whorls of 3, spreading to pendulous, somewhat thickened at nodes, glabrous. **Leaves** decussate, petiolate, simple, ovate-oblong to elliptic-oblong, entire, pinnately nerved; stipules absent. **Inflorescences** simple or branched, axillary or cauline, unisexual spikes bearing ± 8 whorls of small sessile flowers surrounded by moniliform hairs; each spike with 2 opposite basal scales. **Male flowers** with a "perianth" of 2 partly connate scales surrounding a central column bearing at the tip 1 or 2 yellow microsporangia which open by an apical median slit. **Female flowers** with 1 ovule enclosed in an outer fleshy envelope ("perianth") and 2 thinner inner envelopes ("integuments"), the innermost produced into a straight micropylar tube; imperfect flowers usually sterile and lacking outer "integument". **Seed** at maturity enclosed in outer fleshy, coloured "perianth", and an outer "integument" which forms a hard, ridged testa and an inner one which is thin and silky; embryo small, embedded in copious endosperm.

Genus 1; species ± 30, tropical America, western trop. Africa and tropical Asia; sthn trop. Afr. 1.

Gnetum L.

Linnaeus: 637 (1767); Pearson: 330 (1917); Robyns: 11 (1948); Keay: 33 (1954); Kubitzki:386 (1990); Carlquist & Robinson:123 (1995); Rydin *et al.*:197 (2002).

Description as for family.

Species ± 30: ± 7 in tropical America, 2 in western tropical Africa, the rest in tropical Asia; sthn trop. Afr. 1: *Gnetum africanum* Welw., Angola.

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*Pinaceae
(Pinopsida)
(Coniferales)

Glen, H.F. in Leistner: 30 (2000).

Sthn trop. Afr.: genus 1, species 3.

*Pinus L.

Page: 319 (1990); Mullin: 199 (2000); White *et al.*: 84 (2001); Coates Palgrave: 89 (2002); Quinn *et al.*: 513 (2002).

Various species are cultivated in sthn trop. Africa. Coates Palgrave (2002) lists 3 species as invaders of natural vegetation in eastern Zimbabwe; one of them, **Pinus patula* Schiede ex Schltdl. & Cham., is also recorded for the adjacent Mozambique.

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WHITE, F., DOWSETT-LEMAIRE, F. & CHAPMAN, J.D. 2001. *Evergreen forest flora of Malawi*. Royal Botanic Gardens, Kew.

Podocarpaceae
(Pinopsida)
(Coniferales)

Glen, H.F. in Leistner: 30 (2000).

Podocarpus L'Hér. ex Pers.

Lewis: 85 (1960); White: 44 (1970); Silva: 35 (1983); De Laubenfels: 251 (1985); Dowsett-Lemaire & White: 86 (1990); Leistner *et al.*: 233 (1995); Stockey *et al.*: 923 (1998); Mullin: 199 (2000); White *et al.*: 85 (2001); Coates Palgrave: 87 (2002).

Afrocarpus (Buchholz & N.E.Gray) C.N.Page: 339 (1990); Goldblatt & Manning: 50 (2000); Quinn *et al.*: 513 (2002).

Species 95, southern temperate regions and tropical highlands from West Indies to Japan; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi,

Mozambique, and sthn Afr.

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Stangeriaceae
(Cycadopsida)
(Cycadales)

Glen, H.F. in Leistner: 31 (2000).

Genera 2, species 3, Queensland, Australia and Africa; sthn trop. Afr.: genus 1, species 1.

Stangeria T.Moore

Vorster & Vorster: 79/8 (1974/1985); Steyn & Smith: 2 (1999); Goode: 299 (2001); Kokubugata *et al.*: 475 (2001); Grobbelaar: 308 (2002); Izidine & Bandeira: 53 (2002).

Monotypic genus: *Stangeria eriopus* (Kunze) Baill., southern border of Mozambique, and sthn Afr.

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Welwitschiaceae
(Gnetopsida)
(Gnetales)

Glen, H.F. in Leistner: 32 (2000).

Sthn trop. Afr.: genus 1, species 1.

Welwitschia Hook.f.

Bornman: 1 (1978); Bustard: 85 (1990); Kubitzki: 390 (1990); Von Willert: 639 (1993); Carlquist & Gowans: 107 (1995); Steyn & Smith: 1 (1999); Leuenberger: 357 (2001); Van Jaarsveld & Linder Smith: 2 (2001); Coates Palgrave: 93 (2002); Rydin *et al.*: 513 (2002).

Monotypic genus: *Welwitschia mirabilis* Hook.f., confined to the Namib Desert in Angola, and in sthn Afr. (Namibia).

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Zamiaceae
(Cycadopsida)
(Cycadales)

Glen, H.F. in Leistner: 32 (2000).

Sthn trop. Afr.: genus 1, species 14.

Encephalartos Lehm.

Lewis: 79 (1960) under Cycadaceae; Dyer & Verdoorn: 147 (1969); Silva: 8 (1983) under Cycadaceae; Lavranos & Goode: 11 (1985); Johnson & Wilson: 371 (1990); Norstog & Nicholls: 1 (1997); Goode: 1 (2001); White *et al.*: 89 (2001); Coates Palgrave: 74 (2002); Dombo *et al.*: 12 (2002); Grobbelaar: 1 (2002); Izidine & Bandeira: 52 (2002); Mapaura & Timberlake: 170 (2002); Msekandiana & Mlangeni: 38 (2002).

Species ± 65, tropical and sthn Afr.; sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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DICOTYLEDONS

Acanthaceae
(Asteridae—Scrophulariales)
(Asterids—Lamiales)

Balkwill, K. & Welman, W.G. in Leistner: 34 (2000). General family reference: Balkwill & McCallum: 11(1999).

Sthn trop. Afr.: genera 49, species ± 385.

Classification of Acanthaceae of sthn trop. Afr.

[after Scotland & Vollesen (2000)]

I. Subfamily NELSONIOIDEAE (retinacula 0; cystoliths 0; descending cochlear aestivation): *Anisosepalum*, *Elytraria*, *Nelsonia*, *Staurogyne*)
II. Subfamily THUNBERGIOIDEAE (retinacula 0; primarily lianes; bristled anthers; capsules or drupes): *Anomacanthus*, *Pseudocalyx*, *Thunbergia*
III. Subfamily ACANTHOIDEAE (retinacula present; capsules explosive):
1. Tribe **Acantheae** (cystoliths absent; pollen colpate; anthers 4, 1-thecate): *Acanthus*, *Blepharis*, *Crossandra*, *Sclerochiton*, *Stenandrium*
2. Tribe **Ruelliae** (cystoliths present):
a. Subtribe Ruelliinae (left-contort aestivation; filament curtains: filaments united 2 x 2 to the corolla tube thus forming 2 folds which extend to corolla base): *Acanthopale*, *Brillantaisia*, *Dischistocalyx*, *Dinosperma*, *Dyschoriste*, *Hygrophila*, *Mellera*, *Mimulopsis*, *Petalidium*, *Phaulopsis*, *Ruellia*, *Strobilanthopsis*
b. Subtribe Justiciinae (ascending cochlear aestivation; ovules 2 or 4): *Anisotes*, *Asystasia*, *Brachystephanus*, *Dicliptera*, *Ecbolium*, *Hypoestes*, *Isoglossa*, *Justicia*, *Megalochlamys*, *Metarungia*, *Monechma*, *Monothecium*, *Oreacanthus*, *Peristrophe*, *Pseuderanthemum*, *Rhinacanthus*, *Rungia*, *Ruspolia*, *Ruttya*
c. Subtribe Barleriinae (quincuncial aestivation): *Barleria*, *Crabbea*, *Lepidagathis*

Unplaced within Acanthoideae: *Neuracanthus*, *Whitfieldia*
Genus to be excluded from Acanthaceae: *Thomandersia*

Key to genera

1a Seeds not borne on retinacula:
2a Fertile stamens 2:
3a Plants with rosulate leaves and scapose inflorescences; scape covered with alternate bracts from base to tip ..... **Elytraria**
3b Plants prostrate, with internodes visible between leaves, rooting at the nodes ..... **Nelsonia**
2b Fertile stamens 4:
4a Ovary with 1 or 2 collateral ovules in each locule:
5a Shrubs; calyx with 5 lobes; ovary with 1 large ovule per locule; fruit a large drupe with 2 subglobose pyrenes flattened on one side ..... **Anomacanthus**
5b Herbs of various habit or subshrubs; calyx mostly with 10–18 linear lobes or cupular; ovary with 2 collateral ovules per locule; fruit a globose, abruptly rostrate capsule:
6a Anthers opening by apical pores ..... **Pseudocalyx**
6b Anthers mostly opening by ± distinct longitudinal slits: ..... **Thunbergia**
4b Ovary with 4–14 ovules in 2 rows in each locule:
7a Bracteoles fused to base of calyx, resembling anterior calyx lobes and covering the rudimentary lateral lobes ..... **Anisosepalum**
7b Bracteoles not fused to base of calyx; lateral calyx lobes slightly shorter than anterior ones but neither much reduced nor covered by the bracteoles ..... **Staurogyne**
1b Seeds borne on retinacula:
8a Corolla 1-lipped, with the adaxial suture slit; stamens 4, all 1-thecous:
9a Stamens included in corolla tube, filaments epipetalous for most of their length, slender; corolla yellow, orange or red ..... **Crossandra**
9b Stamens exserted beyond corolla throat; filaments epipetalous for up to half their length, stout; corolla white, blue or purple or various combinations of these:
10a Calyx with 5 lobes ..... **Sclerochiton**
10b Calyx with 4 lobes:
11a Seed surface with feathery hygroscopic structures; anticous filaments produced into a protuberance ..... **Blepharis**
11b Seed surface glabrous; filaments not forming a protuberance ..... **Acanthus**
8b Corolla 2-lipped, subregular or regular, adaxial suture not slit; stamens 2 or 4, 1- or 2-thecous:
12a Seeds with hygroscopic uniseriate hairs; corolla aestivation contorted or occasionally imbricate (*Ruellia*) or induplicate (*Neuracanthus*), but then not ascending; fertile stamens mostly 4, sometimes 2:
13a Calyx lobes 4, abaxial and adaxial lobes larger than lateral lobes; stamens not didynamous ..... **Barleria**
13b Calyx lobes 5, rarely 4 (*Hygrophila*), but then these are ± equal in size; stamens didynamous:

14a Corolla regular or subregular:
15a Calyx ± 2-lipped:
16a Calyx with upper lip 3-fid, lower lip 2-fid; corolla with induplicate aestivation in bud ..... **Neuracanthus**
16b Calyx with 2 segments free nearly to base and 3 segments fused nearly to middle; corolla with quincuncial (imbricate) aestivation in bud ..... **Ruellia**
15b Calyx regular to subregular; corolla with contorted aestivation in bud:
17a Inflorescences highly congested dichasial cymes surrounded by bracts ..... **Crabbea**
17b Inflorescences paniculate, spike-like, ± capitate, thyrses, cymes, or flowers solitary:
18a Ovary with 3 or more ovules per locule:
19a Anthers blunt at base; ovules many per locule ..... **Dischistocalyx**
19b Anthers with 1 theca long-spurred; ovules 3 or 4 per locule ..... **Mimulopsis**
18b Ovary with 2 ovules per locule:
20a Densely branched glandular undershrubs with unpleasant smell ..... **Strobilanthopsis**
20b Erect or scrambling shrubs or undershrubs, not glandular, without unpleasant smell ..... **Acanthopale**
14b Corolla distinctly 2-lipped:
21a Calyx lobes 4 ..... **Hygrophila**
21b Calyx lobes 5:
22a Fertile stamens 2:
23a Flowers in a terminal or lateral thyrse; ovary with many ovules per locule ..... **Brillantaisia**
23b Flowers in axillary dichasial cymes; ovary with 2 ovules per loeule ..... **Chaetacanthus**
22b Fertile stamens 4:
24a Capsule with 1 seed per locule ..... **Duosperma**
24b Capsule with 2 or more seeds per locule:
25a Capsule with 2 seeds per locule:
26a Calyx 2-lipped: upper lip 4-lobed, lower lip of 1 much enlarged lobe ..... **Phaulopsis**
26b Calyx regular or subregular with 5 similar to unequal lobes:
27a Ultimate 2 bracts large, enclosing calyx; calyx regular, glandular, lobes 4 or 5 ..... **Petalidium**
27b Ultimate bracts/bracteoles shorter than calyx; calyx regular or subregular, not glandular, lobes 5:
28a Calyx regular, tube longer than lobes, cylindric or narrowly campanulate, 5-ribbed ..... **Dyschoriste**
28b Calyx subregular, tube shorter than lobes, lobes unequal: posterior one usually longer and broader than the others, and lateral lobes often pointed or spinescent ..... **Lepidagathis**
25b Capsule with 3 or more seeds per locule:
29a Calyx ± 2-lipped with 3 teeth connate almost to the middle ..... **Ruellia**
29b Calyx divided almost to base into 5 linear lobes ..... **Mellera**
12b Seeds without hygroscopic uniseriate hairs (although they may have tubercles or hygroscopic glochidiate hairs); corolla aestivation ascending (imbricate); fertile stamens 4 or 2:
30a Fertile stamens 4:
31a Anthers 1-thecous ..... **Stenandrium**
31b Anthers 2-thecous:
32a Ovary with 8 or more ovules in 2 rows ..... **Staurogyne**
32b Ovary with 2 ovules per locule:
33a Bracteoles large, membranous, often coloured ..... **Whitfieldia**
33b Bracteoles small to absent
34a Bracteoles filiform-subulate; anther thecae superposed; capsule stipitate ..... **Asystasia**
34b Bracteoles scale-like at base of calyx; anther thecae at same level; capsule sessile ..... **Thomandersia** [to be excluded from Acanthaceae fide Scotland & Vollesen (2000)]
30b Fertile stamens 2:
35a Anthers 1-thecous:
36a Flowers resupinate (3-lobed lip of corolla above 2-lobed lip); flowers appearing as though enclosed by 2 opposite bracts which may be connate into a tube ..... **Hypoestes**
36b Flowers not resupinate (2-lobed lip of corolla above 3-lobed lip); bracts small:
37a Ovary and style base hairy ..... **Monothecium**
37b Ovary and style base glabrous:
38a Flowers small, corolla tube shorter than 10 mm; inflorescence a many-flowered, terminal, viscid panicle ..... **Oreacanthus**
38b Flowers larger, corolla tube longer than 10 mm:
39a Staminodes 0; style ± capitate ..... **Brachystephanus**
39b Staminodes 2; style 2-branched:
40a Corolla tube considerably longer than upper lip ..... **Ruspolia**
40b Corolla tube shorter than or ± as long as upper lip ..... **Ruttya**
35b Anthers 2-thecous:
41a Flowers resupinate (3-lobed lip of corolla above 2-lobed lip):
42a Capsules with inelastic placental bases ..... **Peristrophe**

42b Capsules with elastic placental bases ..... **Dicliptera**
41b Flowers not resupinate (2-lobed lip of corolla above 3-lobed lip):
43a Corolla with a distinct rugula in upper lip:
44a Pollen sphaeroidal, with a pusticulate ring of exine around the equator; anthers in species with cream flowers attached at right angles to filaments ..... **Isoglossa**
44b Pollen prolate; anthers attached parallel to filaments:
45a Corolla orange, red or yellowy brown, lower lip longer than 25 mm and narrower than 10 mm:
46a Capsules with inelastic placental bases ..... **Anisotes**
46b Capsules with elastic placental bases:
47a Anther thecae blunt at the base ..... **Metarungia**
47b Anther thecae spurred at the base, at least lower one ..... **Rungia**
45b Corolla white, cream, lilac, pink, purple or blue, lower lip shorter than 25 mm or if longer, than broader than 10 mm:
48a Corolla tube longer than lips ..... **Rhinacanthus**
48b Corolla tube shorter than lips:
49a Seeds single in each locule, smooth and shiny ..... **Monechma**
49b Seeds paired in each locule, rough and often tuberculate (sometimes a single smooth, shiny seed is borne in an indehiscent capsule) ..... **Justicia**
43b Corolla without or with an indistinct rugula in the upper lip:
50a Inflorescence with small bracts; calyx easily visible ..... **Pseuderanthemum**
50b Inflorescence with large bracts obscuring the calyx:
51a Corolla thin-textured, lobes ± as long as or longer than the tube, bright or pale blue; staminodes 0; pollen prolate, without pseudocolpi, yellow when fresh ..... **Megalochlamys**
51b Corolla thick-textured, the lobes much shorter than the tube, green, lilac or white; staminodes 2; pollen almost sphaeroidal, with pseudocolpi, white or pink when fresh ..... **Ecbolium**

Acanthopale C.B.Clarke

(Acanthoideae—Ruellieae—Ruelliinae)

Clarke: 62 (1899); Bremekamp: 142 (1943); Heine: 15 (1966a); Binns: 12 (1968); White *et al.*: 112 (2001).

Shrubs or subshrubs, branched, pubescent or glabrescent; branches often obtusely quadrangular. **Leaves** ± cuneate at base, narrowing gradually into petiole; apex caudate-acuminate; margin ± entire; cystoliths often conspicuous, at least when plant dry. **Inflorescence** spike-like, terminal or axillary; bracts obovate, longer than calyx; bracteoles linear to linear-spathulate. **Calyx** equally to subequally divided almost to base into 5 linear to linear-oblong sepals. **Corolla** ± regular, trumpet-shaped with a very short tube, mostly white with pink to purple markings within. **Androecium**: stamens 4, subequal; filaments glabrous to hairy towards base; anthers 2-thecous, parallel, linear-oblong, at equal height, blunt at base. **Gynoecium**: ovary glabrous, 2-locular, with 2 ovules per locule; style hairy, one branch linear-oblong, the other very small and tooth-like or absent. **Capsule** glabrous, elliptic-oblong, bearing 2–4 seeds on retinacula in basal part. **Seeds** lens-shaped, with many hygroscopic hairs.

Species 15, palaeotropics; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Acanthus L.

(Acanthoideae—Acantheae)

Clarke: 105 (1899); Benoist: 24 (1950); Heine: 410 (1963); Heine: 111 (1966a); Napper: 332 (1970); White *et al.*: 112 (2001).

Subshrubs, shrubs or small trees. **Leaves** pinnatifid or lobate to rarely entire, margin often spiny. **Inflorescences** ± dense, short to long terminal spikes; bracts and bracteoles present. **Calyx** divided to base into 4 sepals; anterior and posterior sepal much larger than lateral ones. **Corolla** 1-lipped; tube very short; anterior lip 3–5-lobed with middle lobe outside in bud; posterior lip represented by a thickened sinus at level of insertion of stamens. **Androecium**: stamens 4, ± equal; filaments glabrous; anthers 1-thecous, oblong, muticous, fringed with white hairs. **Gynoecium**: ovary 2-locular, with 2 ascending ovules per locule; style mostly glabrous, bifid at apex. **Capsule** ellipsoid, woody, shiny brown, 2–4-seeded. **Seeds** discoid, glabrous.

Species 30, tropical and warm Old World; sthn trop. Afr. 2, Angola, Zambia, Malawi.

Anisosepalum E.Hossain

(Nelsonioideae)

Hossain: 377 (1972); Champluvier: 127 (1991); Champluvier: 1313 (1994).

Staurogyne Wall., in part; Hossain: 377 (1972).

Herbaceous to suffrutescent, erect to procumbent. **Leaves** opposite, sometimes ternate, entire to crenate-serrate, variably pilose, lower surface often paler than upper. **Inflorescences**: flowers usually many, in spike-like racemes or spikes, terminal or on very short lateral branches, sometimes only 2 or 3; bracts and bracteoles present. **Calyx** of 5 very dissimilar sepals shortly fused at base; posterior ones much shorter than anterior ones; lateral ones much reduced, ± hyaline. **Corolla** 2-lipped, funnel-shaped; upper lip ± cucullate and entire to faintly bilobed. **Androecium**: stamens 4, didynamous, included; anther thecae ellipsoid, diverging, often slightly mucronate at base; staminode 1 or absent. **Disc** usually distinct. **Gynoecium**: ovary glabrous; ovules 4–8(9) per locule, in two rows; style sparsely papillate; stigma bilobed, anterior lobe shorter than bilobed posterior lobe. **Capsule** woody, ovate-triangular in outline, ± compressed. **Seeds** subglobose, with rugose testa.

Species 3, central Africa; sthn trop. Afr. 2, ?Angola, Zambia.

Anisotes Nees

(Acanthoideae—Ruellieae—Justiciinae)

White: 381 (1962); Baden: 623 (1981b); Coates Palgrave: 1020 (2002).

Species 19, tropical and sthn Africa, Madagascar and tropical Arabian Peninsula; sthn trop. Afr. 5, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anomacanthus R.D.Good

(Thunbergioideae/Mendoncioideae)

Good: 161 (1923); Good: 312 (1925); Brummitt: 710 (1990).

Gilletiella De Wild. & T.Durand; Moore: 129 (1930); Benoist: 5 (1950).

Scandent shrubs. **Leaves** shortly petiolate, ovate, entire; without cystoliths. **Flowers** single or few, axillary; bracteoles large, fused, keeled, acuminate, with conspicuous veins, enclosing corolla. **Calyx** annular, very short, truncate. **Corolla** ±2-lobed, lower lip with anterior lobe smaller than others, lobes of upper lip ± fused. **Stamens** 4, of equal length, arising in corolla throat, included; filaments curved, thick, shorter than anthers; posterior anthers 2-locular; anterior ones 1-locular. **Disc** annular, very prominent. **Ovary** subglobose, almost embedded in disc; ovules large, 1 per locule; style elongate, included; stigma funnel-shaped, slightly bifid. **Fruit** drupaceous, large, with 2 large subglobose woody pyrenes flattened on one side; retinacula absent. **Seeds** large, with soft testa.

Monotypic: *Anomacanthus congolanus* (De Wild. & T.Durand) Brummitt (=*A. drupaceus* R.D.Good), Western Zaire and Angola (Cabinda).

Asystasia Blume

(Acanthoideae—Ruellieae—Justiciinae)

Eyles: 485 (1916); Benoist: 25, 36 (1950); White: 381 (1962); Heine: 126 (1966a); Karlström: 235 (1975); Brummitt & Chisumpa: 703 (1978); Edwards: 231 (1987); Edwards: 305 (1991); Kelbessa: 929 (1998); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Barleria L.

(Acanthoideae—Ruellieae—Barleriinae)

Eyles: 483 (1916); Obermeyer: 123 (1933); Benoist: 15, 34 (1950); Heine: 419 (1963); Heine: 161 (1966a); Balkwill & Balkwill: 393 (1996).

Sthn trop. Afr. ± 50, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Blepharis Juss.

(Acanthoideae—Acantheae)

Benoist: 21, 35 (1950); Napper: 323 (1970); Vollesen: 1 (2000); Izidine & Bandeira: 49 (2002).

Sthn trop. Afr. 42, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Brachystephanus Nees

(Acanthoideae—Ruellieae—Justiciinae)

Clarke: 177 (1899); Heine: 237 (1966a); Heine: 649 (1971); Champluvier & Figueiredo: 413 (1996); Figueiredo & Jury: 753 (1996); Mapaura & Timberlake: 161 (2002).

Herbs, subshrubs or shrubs, with adventitious roots, with multicellular, sometimes glandular hairs; stem angular, tomentose to glabrescent. **Leaves** attenuate, caudate, subentire to crenate, petiolate but those subtending inflorescence often almost sessile. **Inflorescences** spicate or paniculate, terminal and axillary; bract and bracteoles present. **Calyx**: sepals 5, separate nearly to base, subequal or unequal, linear. **Corolla** 2-lipped; tube very long and slender; lobes subequal, subentire. **Androecium**: stamens 2, far exserted, arising in mouth of tube; anthers 1-thecous, dorsifixed, obtuse; staminodes absent. **Gynoecium**: ovary fusiform, glabrous; ovules 2 per locule; style glabrous; stigma ± capitate. **Capsule** small, oblong, usually 4-seeded. **Seeds** obovoid, compressed, muricate, without hairs.

Species 10, trop. Africa; sthn trop. Afr. 3, Angola, Zimbabwe, Malawi.

Brillantaisia P.Beauv.

(Acanthoideae—Ruellieae—Ruelliinae)

Burkill: 37 (1899); Benoist: 7 (1950); Heine: 83 (1966a); Binns: 12 (1968); Sidwell: 67 (1998).

Erect to prostrate herbs to erect, sturdy shrubs; stems square, glabrous to densely pubescent; cystoliths longitudinal, narrowing towards one end. **Leaves** broadly ovate to ovate, occasionally elliptic or linear-lanceolate; base cordate to cuneate; margin entire to regularly toothed; glabrous to pubescent; petiolate, lamina decurrent in top half of usually winged petiole. **Inflorescence** a terminal or lateral thyrse; bracts foliaceous; bracteoles linear to obovate. **Calyx** with 5 equal or unequal, linear to spathulate sepals. **Corolla** 2-lipped, purple to blue, occasionally white; tube cylindric with 2 brown-yellow markings in throat; upper lip hooded, 2-lobed; lower lip broad, reflexed at edges, 3-lobed, 2 lateral membranous pouches at base of lower lip forming a hinge with apex of tube. **Androecium** with 2 posterior stamens fertile; filaments white, flattened; anthers sagittate, dorsifixed; 2 anterior ones reduced to slender staminodes, often with vestigial anther, occasionally minute or absent. **Gynoecium**: style slender, not exserted; stigma a single flattened lobe; second lower lobe reduced to a minute tooth; ovules many. **Capsule** linear, pointed, with deep longitudinal grooves down centre of the 2 valves. **Seeds** rounded to slightly kidney-shaped, flattened, borne on retinacula, covered with adpressed hygroscopic hairs.

Species 12, trop. Africa, Madagascar; sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Crabbea Harv.

(Acanthoideae—Ruellieae—Barleriinae)

Ficalho & Hiern: 24 (1881); Clarke: 118 (1899); Eyles: 483 (1916); Binns: 13 (1968); Phiri (Unpublished).

Sthn trop. Afr. 3, Angola, Zambia, Malawi, Zimbabwe, Mozambique, and sthn Afr.

Crossandra Salisb.

(Acanthoideae—Acantheae)

Clarke: 112 (1899); Benoist: 25 (1950); Napper: 334 (1970); Vollesen: 503 (1990); Vos & Edwards: (1992).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dicliptera Juss.

(Acanthoideae—Ruellieae—Justiciinae)

Benoist: 38 (1950); Binns: 13 (1968); Balkwill *et al.*: 1 (1996).

Species ± 150, pantropical; sthn trop. Afr. 22, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dischistocalyx T.Anderson ex Benth. & Hook.f.

(Acanthoideae—Ruellieae—Ruelliinae)

Bentham & Hooker: 1080 (1876) as *Distichocalyx*: Clarke: 60 (1899) as *Distichocalyx*; Moore: 130 (1930); Heine: 397 (1963); Heine: 15 (1966a).

Subshrubs, geniculate and ± ascending, with multicellular hairs, especially on young parts and inflorescence. **Leaves** petiolate, ovate-elliptic or lanceolate, acutely cuneate at base, acuminate, entire or faintly crenulate; with many short, rod-like cystoliths on both surfaces. **Inflorescences** terminal, dense, few-flowered spikes to ± capitate; bracts early deciduous. **Flowers** sessile with minute subulate bracteoles at base of calyx. **Calyx**: lobes unequal: anterior 2 free to base, linear-narrowly elliptic, posterior 3 fused halfway or further. **Corolla** large to medium-sized; lower ± $^1/_4$ of tube narrowly cylindric, upper portion campanulate-funnelshaped; lobes 5, rounded, spreading. **Stamens** 4, arising in narrow, cylindric portion of corolla tube, didynamous; filaments and connectives of anthers finely pubescent; shorter stamens arising above longer ones; anthers all similar, not spurred. **Ovary** glabrous; ovules many; style ± glabrous; stigma with 1 branch well-developed, recurved, other branch rudimentary. **Capsule** linear to narrowly obovate, glabrous, containing ± 10 seeds in each locule. **Seeds** with a ring of hygroscopic hairs.

Species 6, trop. Africa: sthn trop. Afr. 1: *Dischistocalyx hirsutus* C.B.Clarke, Angola (Cabinda).

Duosperma Dayton

(Acanthoideae—Ruellieae—Ruelliinae)

Brummitt: 411 (1974).

Disperma C.B.Clarke in part; Binns: 13 (1968); Mapaura (Unpublished).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dyschoriste Nees

(Acanthoideae—Ruellieae—Ruelliinae)

Clarke: 71 (1899); Eyles: 481 (1916); Benoist: 8, 34 (1950); White: 382 (1962); Binns: 13 (1968); Brummitt: 134 (1983).

Disperma C.B.Clarke in part: Martins: 57 (1994); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ecbolium Kurz

(Acanthoideae—Ruellieae—Justiciinae)

Benoist: 26, 36 (1950); Vollesen: 638 (1989); Bingham (Unpublished); Mapaura (Unpublished).

Species 22, eastern and southern Africa, Madagascar, Comoro Islands, Arabian Peninsula, India and Malaysia; sthn trop. Afr. 4, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Elytraria Michx.

(Nelsonioideae)

Morton: 49 (1956); Dokosi: 256 (1971); Mapaura (Unpublished).

Tubiflora J.F.Gmel.; Moore: 129 (1930); Benoist: 7 (1950).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Hygrophila R.Br. emend. Heine

(Acanthoideae—Ruellieae—Ruelliinae)

Burkill: 30 (1899); Eyles: 481 (1916); Benoist: 7, 34 (1950); Heine: 394 (1963); Heine: 656 (1971).

Hemigraphis in the sense of Benoist: 34 (1950). *Synnema* Benth.; Moore: 129 (1930); Martins: 57 (1994).

Sthn trop. Afr. ± 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hypoestes Sol. ex R.Br.

(Acanthoideae—Ruellieae—Justiciinae)

Clarke: 244 (1900); Eyles: 485 (1916); Benoist: 32, 38 (1950); Binns: 14 (1968); Balkwill & Getliffe Norris: 133 (1985); Mapaura (Unpublished).

Sthn trop. Afr. ± 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Isoglossa Oerst.

(Acanthoideae—Ruellieae—Justiciinae)

Clarke: 227 (1900); Eyles: 486 (1916); Brummitt: 785 (1985); Hansen: 1 (1985); Msekandiana & Mlangeni: 34 (2002).

Sthn trop. Afr. ± 10, ?Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Justicia L.

(Acanthoideae—Ruellieae—Justiciinae)

Benoist: 26, 37 (1950); Heine: 213 (1966a); Morton: 433 (1978); Hedren: 129 (1988); Graham: 551 (1989); Hedren: 1 (1989); Kelbessa: 1 (1990); Champluvier: 231 (2002b).

Adhatoda Mill.; Balkwill & Welman: 36 (2000). *Duvernoia* E.Mey. ex Nees; Manning & Gettliffe Norris: 15 (1995); Izidine & Bandeira: 43 (2002).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lepidagathis Willd.

(Acanthoideae—Ruellieae—Barleriinae)

Clarke: 120 (1900); Eyles: 483 (1916); Benoist: 20, 35 (1950); Morton: 333 (1988).

Sthn trop. Afr. ± 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Megalochlamys Lindau

(Acanthoideae—Ruellieae—Justiciinae)

Vollesen: 605 (1989).

Species 10, eastern and southern Africa, and extending to the Arabian Peninsula; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mellera S.Moore

(Acanthoideae—Ruellieae—Ruelliinae)

Moore: 225 (1879); Lindau: 297 (1896); Clarke: 50 (1899); Eyles: 481 (1916); Binns: 15 (1968); White *et al.*: 116 (2001).

Onus Gilli; Phiri (Unpublished).

Small shrubs. **Leaves** large, petiolate, dentate. **Inflorescences** axillary to terminal spike-like cymes; bracteoles 2, linear-oblong, as long as calyx. **Calyx** divided nearly to base into 5 subequal, linear-oblong sepals. **Corolla** 2-lipped; tube gradually widening, ± as long as lobes; middle lobe of lower lip much larger than lateral ones, hairy within. **Androecium**: stamens 4, subsimilar, exserted; anthers 2-thecous, spurred at base to almost muticous. **Gynoecium**: ovary with 4–6 ovules in each locule; style filiform, with 1 oblong-linear stigmatic arm, posterior arm suppressed. **Capsule** seed-bearing almost from base. **Seeds** compressed, glabrous on faces but with long white hygroscopic hairs on margin, borne on retinacula.

Species 4 or 5, trop. Africa; sthn trop. Afr. 3 or 4, Zambia, Zimbabwe, Malawi, Mozambique.

Metarungia C.Baden

(Acanthoideae—Ruellieae—Justiciinae)

Baden: 638 (1984); Edwards *et al.*: 200 (2001); Phiri (Unpublished).

Macrorungia of various authors, not of C.B.Clarke; Binns: 15 (1968); Baden: 143 (1981a); Coates Palgrave: 1018 (2002).

Species 3, tropical and sthn Afr.; sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mimulopsis Schweinf.

(Acanthoideae—Ruellieae—Ruelliinae)

Schweinfurth: 677 (1868); Lindau: 301 (1896); Clarke: 54 (1899); Binns: 15 (1968); White *et al.*: 116 (2001); Bingham (Unpublished).

Perennial herbs to shrubs. **Leaves** long-petioled, ± ovate, irregularly dentate. **Inflorescence** paniculate, usually composed of dichasia, lax or dense; bract usually remote from calyx; bracteoles 2, linear or ligulate, persistent, shorter than calyx. **Calyx** divided nearly to base into 5 subequal, linear or narrowly ligulate sepals. **Corolla** almost regular; tube widely campanulate; petals 5, subequal, ovate, contorted in bud. **Androecium**: stamens 4, subsimilar; filaments nearly glabrous; anthers of 2 anterior stamens with 1 theca long-spurred. **Disc** low, thick. **Gynoecium**: ovary with 3 or 4 ovules per locule. **Capsule** lanceolate, seed-bearing from base, usually with 6 or 8 seeds. **Seeds** compressed, nearly glabrous on faces but with many hygroscopic hairs on margin, borne on long retinacula.

Species 30, trop. Africa, Madagascar; sthn trop. Afr. ?2, Zambia, Zimbabwe, Malawi.

Monechma Hochst.

(Acanthoideae—Ruellieae—Justiciinae)

Clarke: 212 (1900); Eyles: 486 (1916); Benoist: 29, 37 (1950); Munday: 47 (1995).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Monothecium Hochst.

(Acanthoideae—Ruellieae—Justiciinae)

Hochstetter: 74 (1842); Lindau: 340 (1896); Clarke: 175 (1899).

Subshrubs or small shrubs. **Leaves** large, entire. **Inflorescences** dense, many-flowered terminal spikes; bracts and bracteoles linear or bristle-like. **Calyx** 5-fid to base; segments equal, linear. **Corolla** 2-lipped; tube straight; anterior lip 3-lobed; posterior lip notched at tip. **Androecium**: stamens 2, arising in throat, slightly exserted; anthers 1-thecous, muticous. **Disc** annular. **Gynoecium**: ovary and style base hairy; style branches 2, equal, very short, oblong; ovules 2 per locule. **Capsule** oblong, 4(2)-seeded, lower part contracted. **Seeds** discoid, wrinkled, without hairs, borne on very long retinacula.

Species 3, trop. Africa to S India; sthn trop. Afr. 1: *Monothecium aristatum* (Nees) T.Anderson, Angola.

Nelsonia R.Br.

(Nelsonioideae)

Bremekamp: 246 (1955); Heine: 158 (1966a); Binns: 15 (1968); Vollesen: 315 (1994).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Neuracanthus Nees

(Unplaced within Acanthoideae)

Bidgood & Brummitt: 1 (1998); Furness: 77 (1998).

Species 30, trop. Africa, Madagascar, Arabian Peninsula and tropical Asia; sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Oreacanthus Benth.

(Acanthoideae—Ruellieae—Justiciinae)

Bentham: 1104 (1876); Friis & Vollesen: 465 (1982); Champluvier & Figueiredo: 413 (1996).

Subshrubs or shrubs. **Leaves** large, entire. **Inflorescence** many-flowered, terminal, viscid-hairy panicle composed of dichasia; bracts and bracteoles small, linear. **Calyx** small, divided to base into 5 equal, linear segments. **Corolla** 2-lipped, small; tube campanulate, short; anterior lip 3-lobed; posterior lip subentire. **Androecium**: stamens 2, exserted beyond lips; anthers 1-thecous, muticous. **Gynoecium**: ovary and style base glabrous; stigma entire or 2-lobed; ovules 2 per cell. **Capsule** oblong, 4-seeded, lower part contracted. **Seeds** discoid, wrinkled, without hairs, borne on long retinacula.

Species 4, central Africa; sthn trop. Afr. 2(3), Angola, Zambia.

Peristrophe Nees

(Acanthoideae—Ruellieae—Justiciinae)

Benoist: 31 (1950); Binns: 15 (1968); Brummitt: 290 (1991); Balkwill: 83 (1996); Balkwill & Campbell-Young: 551 (2001); Mapaura & Timberlake: 161 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, ?Mozambique, and sthn Afr.

Petalidium Nees

(Acanthoideae—Ruellieae—Ruelliinae)

Benoist: 11 (1950); Mapaura (Unpublished).

Sthn trop. Afr. ± 15, Angola, Zimbabwe, and sthn Afr.

Phaulopsis Willd.

(Acanthoideae—Ruellieae—Ruelliinae)

Benoist: 10 (1950) as *Phaylopsis*; Binns: 15 (1968) as *Phaylopsis*; Mankeltow: 78 (1996).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pseuderanthemum Radlk.

(Acanthoideae—Ruellieae—Justiciinae)

Milne-Redhead: 255 (1936); Benoist: 25 (1950); Heine: 167 (1966a); Binns: 15 (1968); Edwards & Harrison: 187 (1998); White *et al.*: 118 (2001); Champluvier: 33 (2002a).

Eranthemum L., in part; Clarke: 169 (1899); Binns: 13 (1968).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pseudocalyx Radlk.

(Thunbergioideae)

Radlkofer: 416 (1883); Benoist: 149 (1944); Heine: 421 (1963); Heine: 55 (1966a); Breteler: 809 (1994); Breteler: 271 (1998); Schönenberger & Endress: 446 (1998).

Lianes with ± 4-angled, sparsely stellate branchlets. **Leaves** petiolate, ± elliptic, entire to somewhat crenulate. **Inflorescence** an axillary or terminal raceme; bracteoles enveloping calyx and corolla tube. **Calyx** thin, cupular. **Corolla** slightly 2-lipped with contorted lobes; lower lip 3-lobed, upper one 2-lobed. **Androecium**: stamens 4, enclosed, arising ± in middle of corolla tube; anthers 2-thecous, opening by apical pores. **Disc** cupular, glabrous. **Gynoecium**: ovary slightly laterally compressed; ovules 2 per locule; stigma 2-lobed. **Capsule** subovoid, beaked. **Seeds** ovoid to dorsally compressed, smooth or warted, not borne on retinacula.

Species 5, trop. Africa, Madagascar; sthn trop. Afr. 1: *Pseudocalyx saccatus* Radlk. (=*P. africanus* S.Moore), Zambia, Zimbabwe, Mozambique. Essentially the genus differs from *Thunbergia* only in the anthers, which dehisce by apical pores, not by longitudinal slits.

Rhinacanthus Nees

(Acanthoideae—Ruellieae—Justiciinae)

Clarke: 224 (1900); Benoist: 26 (1950); Heine: 200 (1966a); Balkwill: 11 (1995); Bingham (Unpublished).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ruellia L.

(Acanthoideae—Ruellieae—Ruelliinae)

Clarke: 44 (1899); Benoist: 8 (1950); Eyles: 483 (1916); Furness & Grant: 231(1996); Bingham (Unpublished).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rungia Nees

(Acanthoideae—Ruellieae—Justiciinae)

Nees: 77, 109 (1832); Clarke: 252 (1900); Moore: 138 (1930); Heine: 429 (1963); Heine: 204 (1966a).

Subshrubs, up to 3 m high, pubescent to glabrous. **Leaves** long-petiolate, elliptic-lanceolate, acuminate, entire. **Inflorescence** axillary to terminal strobilate spikes with large membranous, veined bracts arranged in 4 rows of which 2 do not subtend flowers. **Flowers** small, sessile, solitary in axils of bracts and accompanied by 2 large to very small membranous or transparent bracteoles. **Calyx** with 5 subequal pointed teeth, usually membranous or transparent. **Corolla** 2-lipped; tube short, straight, slightly widening towards mouth; upper lip inside in bud, straight, concave, entire or 2-toothed; lower lip usually longer than upper, spreading, 3-lobed. **Stamens** 2, arising in mouth of tube, shorter than upper lip; anthers with 2 separate, slightly displaced thecae, lower one or both spurred; staminodes absent. **Gynoecium** pubescent; stigma slightly 2-lobed; ovules 2 per locule. **Capsule** compressed globose, ovoid or oblong; placentas arising elastically in fruit to throw out seeds. **Seeds** 4, flattened, reniform-suborbicular, rugose.

Species 50, tropical Old World; sthn trop. Afr. 1: *Rungia grandis* T.Anderson, Angola; specimen *Gomes Pedro 4246* (PRE) from Mozambique was identified as *Rungia* sp.

Ruspolia Lindau

(Acanthoideae—Ruellieae—Justiciinae)

Milne-Redhead: 269 (1936); Benoist: 36 (1950).

Eranthemum L., in part; Clarke: 169 (1899).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ruttya Harv.

(Acanthoideae—Ruellieae—Justiciinae)

Specimen in PRE: *O.B. Miller 7234*; Brummitt (Unpublished).

Sthn trop. Afr. 1: *Ruttya ovata* Harv., Mozambique (specimens in PRE: *O.B.Miller 7234* and others), and sthn Afr.

Sclerochiton Harv.

(Acanthoideae—Acantheae)

Benoist: 24, 36 (1950); Napper: 333 (1970); Vollesen: 1 (1991); Coates Palgrave: 1016 (2002); Mapaura & Timberlake: 161 (2002).

Species 19, tropical and sthn Afr.; sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Staurogyne Wall.

(Nelsonioideae)

Wallich: 80 (1831); Bremekamp: 162 (1955); Champluvier: 98 (1991); Champluvier: 1322, 1328 (1994); Bingham (Unpublished); Phiri (Unpublished).

Erect to ascending forest herbs, usually densely pubescent in upper parts. **Leaves** narrowly elliptic to elliptic-oblong, sometimes obovate, rarely ovate, entire, petiolate. **Inflorescences** terminal or sometimes terminal and axillary, spicate; bracts narrowly elliptic to linear-elliptic, acuminate; bracteoles linear-elliptic. **Calyx** almost free to base, posterior one broader than others. **Corolla** 2-

lipped; upper lip 2-lobed with lobes divided by a notch; lower lip 3-lobed. **Androecium**: stamens 4, didynamous, rarely 2, included or hardly exserted; anthers 2-thecous, thecae ± parallel, ± mucronate at base, opening by longitudinal slits; staminode small or absent. **Gynoecium**: ovary ellipsoid-cylindric, with 8–14 ovules per locule in 2 rows; style glabrous; stigma unequally 2-lobed. **Capsule** slightly compressed, ± ovoid-conical; retinacula 0. **Seeds** subglobose, without hairs.

Speeies ± 140, pantropical, 5 in Africa; sthn trop. Afr. 1: *Staurogyne letestuana* Benoist, Angola (Cabinda); Zambia.

Stenandrium Nees

(Acanthoideae—Acantheae)

Nees: 444 (1836); Vollesen: 169 (1992).

Stenandriopsis S.Moore; Benoist: 25 (1950); Heine: 99 (1966a).

Perennial herbs or shrubs. **Leaves** opposite, elliptic to obovate; apex subacute to long-acuminate; base cordate to decurrent on petiole; margin entire to shallowly crenate. **Inflorescence** dense or lax terminal or axillary spikes; bracts imbricate or not, lower usually sterile; bracteoles 2, glumaceous, linear to narrowly ovate. **Calyx** divided almost to base into 5 sepals, thickened and horny at base. **Corolla** 2-lipped; tube cylindric, straight or slightly curved; upper lip 2-lobed; lower lip 3-lobed. **Androecium**: stamens 4, included; filaments filiform; anthers 1-thecous, oblong with apiculate tip; staminode sometimes present. **Gynoecium**: ovary with 2 ovules per locule; style filiform; stigma ± distinctly 2-lobed. **Capsule** 4-seeded, oblong-ellipsoid, sessile, glumaceous, beaked. **Seeds** discoid, tuberculate.

Species ± 50, sthn USA to Argentina and Chile, 8 in trop. Africa, 10 in Madagascar; sthn trop. Afr. 2, Angola (Cabinda).

Strobilanthopsis S.Moore

(Acanthoideae—Ruellieae—Ruelliinae)

Moore: 202 (1900); Milne-Redhead: 344 (1932).

Pseudacanthopale Benoist: 9 (1950).

Densely branched, glandular undershrubs with unpleasant smell. **Leaves** ranging in size from large on primary shoots to small on tertiary shoots, entire. **Flowers** solitary or few. **Calyx** divided almost to base into 5 linear segments. **Corolla** obscurely 2-lipped, contorted in bud; lobes subequal, lilac; throat orange. **Androecium**: stamens 4, didynamous; anthers 2-thecous, similar, not spurred. **Disc** shortly cup-shaped. **Gynoecium**: capsule with 2 ovules per locule, only upper one developing into a seed. **Capsule** oblong, 2-seeded. **Seeds** with hygroscopic hairs.

Species 5, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi.

Thomandersia Baill.

[To be excluded from Acanthaceae—see Scotland & Vollesen: 572 (2000)].

Baillon: 456 (1891); Bremekamp: 166 (1942); Heine: 143 (1966a); Heine: 207 (1966b); Wortley: 4 (2003).

Arborescent shrubs or small trees; upper branches ± dichotomous. **Leaves** petiolate, oval-elliptic, cuneate at base. **Inflorescence**: terminal or subterminal racemes; flowers ± opposite, verticillate or scattered; bracts subulate-acicular; bracteoles scale-like at base of calyx. **Calyx** regular to slightly irregular, with an adaxial glandular swelling; lobes short. **Corolla** 2-lipped; lobes 5; tube ± cylindric; white or faintly rose-purple. **Androecium**: stamens 4, didynamous; filaments basally fused to corolla; anthers 2-thecate, parallel, arising at same level; staminode minute. **Disc** thin. **Gynoecium**: ovary 2-locular, subglobose; 2 ovules per locule; style filiform; stigma cylindric. **Capsule** subglobose to ellipsoid, glabrous, surrounded at base by accrescent calyx. **Seeds** 2 per locule, ovoid-ellipsoid, somewhat flattened, resembling a small pine cone due to scale-like testa markings.

Species 6, trop. Africa; sthn trop. Afr. 1: *Thomandersia hensii* De Wild. & T.Durand, Angola.

Thunbergia Retz.

(Thunbergioideae)

Benoist: 6, 33 (1950); Heine: 58 (1966a); Binns: 16 (1968); Schönenberger & Endress; 446 (1998); White *et al.*: 119 (2001).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Whitfieldia Hook.

(Unplaced within Acanthoideae)

Hooker: t. 4155 (1845); Clarke: 65 (1899); Benoist: 8 (1950); White: 383 (1962); Heine: 32 (1966a); Furness & Vollesen: 729 (1991); Bingham (Unpublished); Phiri (Unpublished).

Shrubs, nearly glabrous except inflorescence. **Leaves** ± elliptic, acuminate at both ends, petiolate, margins entire. **Inflorescences** racemose, spicate or ± paniculate; bracts large or small; bracteoles large, membranous, often coloured. **Calyx** divided almost to base into 5 subequal, narrowly oblong, petaloid sepals. **Corolla** with 5 subequal lobes; tube long and narrowly cylindric or shorter and dilated nearly from base. **Androecium**: stamens 4, subsimilar, didynamous, included; anthers 2-thecous with thecae parallel and muticous at base. **Gynoecium**: ovary glabrous; ovules 2 per locule; stigma capitate to obscurely 2-lobed. **Capsule** stalked, 2- or 4-seeded. **Seeds** discoid, nearly smooth, hairless.

Species 10, trop. Africa; sthn trop. Afr. 2, Angola, Zambia.

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Achariaceae
(in broad sense) (including Kiggelariaceae)
(Dilleniidae—Violales)
(Eurosids I—Malpighiales)

Trees or shrubs, usually containing cyanogenic glucosides. **Leaves** alternate, simple, entire or toothed, teeth not salicoid; stipules present or 0. **Inflorescence**: axillary racemes, sometimes spike-like cymes, cymose panicles, fascicles, or flowers solitary. **Flowers** unisexual or bisexual, regular, variously sized. **Sepals** 3–5, free to partly fused at base, sometimes unequal, sometimes spirally arranged and similar to petals, or sepals and petals in distinct whorls. **Petals** (4)5–14, free, often with an adnate adaxial scale; when arranged in whorls and clearly distinct from sepals, then often larger and more numerous than sepals. **Disc** and glands usually absent. **Stamens** (5–)8–many, free; anthers mostly relatively large and linear or oblong, 2-

thecous, opening by longitudinal slits or sometimes terminal pores. **Ovary** superior or rarely half-inferior, 1-locular with several to many ovules on (2)3–8 parietal placentas; style 1, simple and subentire to ± deeply divided into (2)3–8 branches. **Fruit** a capsule dehiscing with 3–8 valves, sometimes woody and dehiscing very tardily, sometimes with 4–6(–8) wings. **Seeds** several to many, sometimes arillate and sometimes pubescent; endosperm usually copious; embryo straight with broad cotyledons.

Sthn trop. Afr.: genera 10, species 19.

Archer, R.H. in Leistner: 45 (2000), under Flacourtiaceae.

Chase *et al.*: 171 (2002). See under Flacourtiaceae (in broad sense) for a discussion on the breaking up of that family.

Key to genera

1a Sepals 4 or 5; petals ± as many as sepals; stamens 8–many:
2a Petals whorled (cyclically arranged); stamens 8–12 ..... **Kiggelaria**
2b Petals spirally arranged; stamens either 5 or 16 or more:
3a Stamens 5 ..... **Scottellia**
3b Stamens 16 or more:
4a Sepals free, ± half as large as petals; racemes subspicate, rather short ..... **Rawsonia**
4b Sepals connate in lower third, ± as large as petals; racemes slender, elongate ..... **Dasylepis**
1b Sepals 3; petals more than sepals; stamens many:
5a Fruit with 4–6 crenate membranous wings:
6a Petals 5–7; style short, with (2)3(4) ± horizontally diverging stigmas as long as or longer than style ..... **Grandidiera**
6b Petals 10–12; style simple, entire ..... **Poggea**
5b Fruit a capsule, often woody, or indehiscent, smooth or with spines or soft bristles:
7a Sepals valvate; fruit echinate with branching soft bristles or spines ..... **Buchnerodendron**
7b Sepals imbricate; fruit smooth, or with simple bristles or spines:
8a Style filiform, entire, rarely shortly divided; fruit 1–3-seeded ..... **Lindackeria**
8b Style with 5–8 stigmatic lobes or branches; fruit many-seeded:
9a Fruit with a thick woody pericarp; petiole not swollen distally ..... **Xylotheca**
9b Fruit a capsule with a leathery or fibrous pericarp; petiole swollen distally ..... **Caloncoba**

Buchnerodendron Gürke

(Lindackerieae)

Gürke: 151 (1893); Exell & Mendonça: 84 (1937/1951); Wild: 267 (1960); Wild & Midigal: 7 (1973); Sleumer: 289 (1974b); Sleumer: 13 (1975); Hul: 39 (1995).

Unarmed small bushes; sometimes dioecious; branches stiffly erect, golden-tomentose at first, later glabrescent. **Leaves** ovate-oblong, broadly ovate or obovate, base cordate, margins serrate; petiolate with ± caducous stipules. **Flowers** in axillary, cymose panicles, racemes or fascicles, bisexual or unisexual. **Sepals** 3, subvalvate, free to base. **Petals** 6–12, imbricate, larger than sepals. **Stamens** very many, in two series, outer somewhat longer than inner ones; filaments slender, rather short; anthers linear, dehiscing by slits. **Ovary** 1-locular, with 3–5 parietal, multi-ovulate placentas; style simple, apex subentire. **Fruit** a globose, tardily dehiscent (? or indehiscent), echinate capsule splitting into 3–5 longitudinal valves. **Seeds** moderately numerous, ovoid or compressed, with a crustaceous testa, arillate at base, sometimes pubescent; embryo straight, cotyledons foliaceous, ovate.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

Caloncoba Gilg

(Lindackerieae)

Gilg: 458 (1908); Exell: 20 (1926); White: 265 (1962); Wild & Vidigal: 10 (1973); Sleumer: 120 (1974a); Sleumer: 21 (1975); Hul: 40 (1995) sinks the genus under *Oncoba*; White *et al.*: 266 (2001).

Small shrubs or small to medium trees with unarmed branches. **Leaves** on long petioles or almost sessile; lamina glabrous, scaly or hairy, sometimes glandular-punctate; stipules caducous. **Flowers** often large, in axillary fascicles or solitary, bisexual and male, often appearing before leaves. **Sepals** 3, imbricate, concave. **Petals** 8–12, larger than sepals. **Stamens** many, with linear or sagittate-linear anthers dehiscing by slits or pores. **Ovary** 1-locular with 5–8 multi-ovulate placentas; style simple with 5–8 distinct stigmas, or stigmatic apex only slightly lobed and somewhat peltate. **Fruit** an echinate or smooth, dehiscent, ovoid, globose or ellipsoid capsule splitting into 5–8 valves, many-seeded and sometimes with a fleshy or gelatinous pulp.

Species ± 8, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Malawi, Mozambique.

Dasylepis Oliv.

(Erythrospermeae)

Oliver: 170 (1865); Burtt Davy & Hoyle: 54 (1958); Wild: 263 (1960); Sleumer: 6 (1975).

Trees with glabrous vegetative parts; branches slender, dark brown, striate. **Leaves** entire or serrulate, often somewhat undulate, petiolate with caducous stipules. **Flowers** bisexual or male by abortion, in lax racemes or crowded and ± spicate. **Sepals** 4 or 5, almost free, outer ones scarcely smaller, usually orbicular. **Petals** 4–7, imbricate like inner sepals but larger, with thick hairy scales adnate at base within. **Stamens** indefinite, free; anthers linear to narrowly lanceolate, dehiscing longitudinally. **Ovary** free, glabrous or hairy, 1-locular with 2–4

multi-ovulate placentas; style short or long, simple or divided in upper half into 2–4 branches ending in short stigmas. **Fruit** a globose capsule with hard leathery pericarp; style persistent, splitting into 2–4 longitudinal sections. **Seeds** few.

Species 6, trop. Africa; sthn trop. Afr. 1: *Dasylepis burtt-davyi* Edlin, endemic, as far as is known, to Mt Mlanje, Malawi.

Grandidiera Jaub.

(Lindackerieae)

Jaubert: 467 (1866); Wild & Vidigal: 8 (1973); Sleumer: 11 (1975).

Shrubs or trees. **Leaves** alternate, persistent, petiolate, oblanceolate to obovate, entire or undulate, penninerved; stipules subulate, pubescent. **Flowers** unisexual or bisexual; bisexual flowers with slightly larger sepals and petals and with fewer (35–50) stamens than male flowers. **Inflorescences** short, axillary, few-flowered, spike-like, shortly hairy racemes from upper axils; terminal flower bisexual, lower flowers male; subtending bracts several, membranous, small. **Sepals** 3, imbricate, small. **Petals** 5–7, imbricate, small. **Stamens** many; filaments filiform; anthers dorsifixed near base, longitudinally dehiscent. **Ovary** 1-locular, with 2–4 multi-ovulate parietal placentas, sessile, shortly 4–6(–8)-winged; style short; stigmas (2)3(4), horizontally divergent. **Fruit** globular, woody, tardily dehiscent, with 4–6(–8) short, membranous, crenate wings. **Seeds** many, ovoid, small.

Monotypic genus: *Grandidiera boivinii* Jaub., eastern trop. Africa; sthn trop. Afr.: Mozambique.

Kiggelaria L.

(Pangieae)

Wild: 265 (1960); Wild & Midigal: 5 (1973); Sleumer: 31 (1975); Killick: 60 (1976); White *et al.*: 273 (2001); Coates Palgrave: 751 (2002).

Sthn trop. Afr. 1: *Kiggelaria africana* L., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lindackeria C.Presl

(Lindackerieae)

Presl: 89, t. 65 (1835); Sleumer: 83, 361 (1937/1951); Wild: 267 (1960); White: 266 (1962); Sleumer: 311 (1974d); Sleumer: 24 (1975); Killick: 60 (1976); Hul: 40 (1995) sinks the genus under *Oncoba*; White *et al.*: 274 (2001).

Unarmed shrubs or trees. **Leaves** simple; lamina usually rather large, glabrous or hairy, hairs stellate or simple, margins usually toothed; petioles sometimes elongate; stipules present. **Flowers** bisexual or male by abortion, in racemes or solitary in axils. **Sepals** 3, imbricate, concave. **Petals** 6–12, imbricate, not much longer than sepals. **Stamens** many; filaments slender, free or rarely connate in a tube; anthers linear. **Ovary** shortly stalked, smooth, tuberculate or shortly echinate, usually hairy, 1-locular with 3 parietal placentas; placentas multi-ovulate or with relatively few ovules; style simple with inconspicuous stigmas. **Fruit** a globose, woody, echinate or warted capsule dehiscing tardily into 3 longitudinal valves. **Seeds** 1–3, with copious endosperm and a large embryo with flat, cordate cotyledons.

Species 13, trop. Africa; sthn trop. Afr. 4, Angola, Zambia, Malawi.

Poggea Gürke

(Lindackerieae)

Gürke: 162 (1893); Sleumer: 80, 360 (1937/1951); Bamps: 11 (1968); Sleumer: 296 (1974c); Hul: 35 (1995).

Unarmed shrubs. **Leaves** alternate, petiolate, obovate, attenuate towards base, acuminate at apex, denticulate, papyraceous; stipules lanceolate, pubescent, persistent. **Flowers** bisexual, solitary in axils of upper leaves; peduncle pubescent. **Sepals** 3, imbricate, oblong to suborbicular, tomentose outside, glabrous inside. **Petals** 10–12, obovate, puberulous inside. **Stamens** many; filaments filiform, glabrous; anthers longitudinally dehiscent. **Ovary** superior, 1-locular, with 2–5 multi-ovulate parietal placentas; style simple, entire, persistent in fruit, glabrescent. **Capsules** ovoid, with 4–6 broad coriaceous wings, tardily dehiscent. **Seeds** many, ovoid, angular, finely pubescent.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola.

Rawsonia Harv. & Sond.

(Erythrospermeae)

Sleumer: 79 (1937/1951); Wild: 262 (1960); Wild & Vidigal: 3 (1973); Killick: 54 (1976); White *et al.*: 276 (2001); Coates Palgrave: 748 (2002); Msekandiana & Mlangeni: 41 (2002); Lebrun & Stork: 420 (2003); Mapaura (Unpublished).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Scottellia Oliv.

(Erythrospermeae)

Oliver: t. 2265 (1893); Sleumer: 79 (1937/1951); Bamps: 9 (1968); Sleumer: 275 (1972); Hul: 32 (1995).

Dasypetalum Pierre ex A.Chev.

Trees up to 30 m high; trunk straight, slightly fluted; branchlets glabrous. **Leaves** alternate, persistent, simple, entire to crenulate, petiolate, cuneate at base, acuminate at apex, coriaceous, glabrous, with 5–8 pairs of secondary nerves; petiole thickened at both ends; stipules 0. **Inflorescences**: racemes grouped in pseudopanicles, axillary; rachis slender to subfiliform; bracts minute, caducous. **Flowers** bisexual. **Sepals** 5, elliptic-ovate, ciliate. **Petals** 5, similar in size to sepals but usually thinner, oblong-ovate to elliptic-obovate, each with a basal scale-like hairy appendage. **Stamens** 5, alternating with petals; filaments linear-subulate, ± twice as long as anthers; anthers acutely triangular in outline, deeply bifid up to basal attachment of filament, longitudinally dehiscent. **Ovary** substipitate, glabrous, 1-locular with 3 pluri-ovulate parietal placentas; style short, shortly trifid at apex. **Fruit** a subglobose capsule splitting into 3 eventually ± reflexed valves; pericarp coriaceous to almost woody, pustular or verruculose outside, smooth or wrinkled inside. **Seeds** 1 or 2(3), subglobose-angular, smooth, covered by a thin bright red or orange-red arillus.

Species 3, tropical (mainly W) Africa; sthn trop. Afr. 1: *Scottellia klaineana* Pierre (=*S. gossweileri* Exell), Angola.

Xylotheca Hochst.

(Lindackerieae)

Sleumer: 81 (1937/1951)); Wild: 272 (1960); Wild & Vidigal: 11 (1973);

Sleumer: 18 (1975); Killick: 58 (1976); Coates Palgrave: 750 (2002).

Sthn trop. Afr. 2, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Aizoaceae
(including Tetragoniaceae)
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Dreyer, L.L. & Jordaan, M. in Leistner: 46 (2000) with key to all local genera.

Sthn trop. Afr.: genera 7, species 25.

Aizoanthemum Dinter ex Friedrich

Gonçalves: 330 (1970); Hartmann: 28 (2002a).

Sthn trop. Afr. 1: *Aizoon mossamedense* (Welw. ex Oliv.) Friedrich, Angola, and sthn Afr.

Aizoon L.

Gonçalves: 330 (1970); Gonçalves: 509 (1978a); Gonçalves: 1 (1979a); Hartmann: 30 (2002a).

Sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique, and sthn Afr.

Galenia L.

Gonçalves: 331 (1970); Gonçalves: 511 (1978a); Hartmann: 28 (2002b).

Sthn trop. Afr. 2, Angola, Zimbabwe, and sthn Afr.

Sesuvium L.

Gonçalves: 322 (1970); Gonçalves: 514 (1978a); Gonçalves: 4 (1979a); Hartmann: 296 (2002b); Lebrun & Stork: 266 (2003).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tetragonia L.

Gonçalves: 333 (1970); Gonçalves: 553 (1978b) under Tetragoniaceae; Gonçalves: 1 (1979b); Hartmann: 316 (2002b).

Sthn trop. Afr. 3: 2 indigenous in Angola and Mozambique, and **T. tetragonoides* (Pall.) Kuntze, native of New Zealand, cultivated and naturalised in Angola and Mozambique.

Trianthema L.

Gonçalves: 327 (1970); Gonçalves: 516 (1978a); Gonçalves: 6 (1979a); Hartmann: 330 (2002b).

Sthn trop. Afr. 4, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Zaleya Burm.f.

Gonçalves: 329 (1970); Gonçalves: 520 (1978a); Gonçalves: 12 (1979a); Hartmann: 351 (2002b).

Sthn trop. Afr. 1: *Zaleya pentandra* (L.) Jeffrey, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Alangiaceae

(Asteridae—Cornales)
(Asterids—Cornales; included in Cornaceae)

Trees; twigs pubescent to glabrescent. **Leaves** alternate, simple, entire to undulate, often asymmetric at base, 5- to 7-nerved from base; stipules 0. **Flowers** bisexual, regular, in few-flowered axillary cymes with articulated pedicels; buds flask-shaped. **Calyx**: tube ± funnel-shaped; limb spreading, with 5–8 teeth. **Petals** 5–8, free or slightly coherent at base, strap-shaped, pubescent outside. **Stamens** as many as and alternating with petals, free or slightly cohering at base, with a fringe of hairs on inside; anthers 2-thecous, linear, basifixed, introrse, opening longitudinally. **Disc** subglobose, above ovary at base of style. **Ovary** inferior, 1- or 2-locular with 1 anatropous, unitegmic, pendulous ovary from apex of each locule; style 1, cylindric; stigma slightly lobed. **Fruit** a small, 1- or 2-seeded, ± globose drupe crowned by remnants of disc and sepals. **Seeds** 1 per locule; endosperm abundant, oily; embryo large, straight.

Genus 1, species 21, Old World tropics; sthn trop. Afr. 1.
Candolle: 203 (1828); Verdcourt: 1 (1958); Cannon: 363 (1978); Takhtajan: 383 (1997).

Alangium Lam.

Lamarck: 174 (1783) name conserved; Cannon: 363 (1970); Cannon: 633 (1978); Dowsett-Lemaire & White: 75 (1990); White *et al.*: 121 (2001); Coates Palgrave: 857 (2002); Mapaura & Timberlake: 161 (2002).

Description as for family.

Species 21, trop. Africa, Madagascar, eastern and tropical Asia to eastern Australia and New Caledonia; sthn trop. Afr. 1: *Alangium chinense* (Lour.) Harms, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

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Amaranthaceae

(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales; including Chenopodiaceae)

Jordaan, M. in Leistner: 49 (2000).

Identification of additional genera using the key in the above reference:

Blutaparon: runs to *Gomphrena* from which it differs in having the inner 3 tepals smaller than the outer 2 and in flowers whieh are strongly compressed, with carinate tepals with tips incurved towards the stigmas.

Centemopsis: runs to *Achyropsis* from which it differs in its linear to filiform (not elliptic to ovate) leaves.

Mechowia: specimens with alternate leaves run to *Sericocoma* from which they differ in having glabrous (not hairy) tepals; specimens with opposite leaves run to *Achyropsis* from which they differ in having densely hairy (not glabrous) ovaries.

Sericostachys: runs somewhat uncomfortably to *Pandiaka* from which it differs in having broad panicles, and sterile flowers formed of long plumose hairs alongside the fertile ones.

Sthn trop. Afr.: genera 25, species 99.

Achyranthes L.

Townsend: 105 (1988).

Sthn trop. Afr. 1: *Achyranthes aspera* L. with 3 varieties, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Achyropsis (Moq.) Hook.f.

Townsend: 110 (1988).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aerva Forssk.

Townsend: 93 (1988).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Alternanthera Forssk.

Townsend: 121 (1985); Townsend: 124 (1988).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Amaranthus L.

Brown: 414 (1810); Townsend: 45 (1988).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Blutaparon Raf.

Rafinesque: 45 (1838); Mears: 111 (1982); Townsend: 90 (1993).

Philoxerus not of R.Br.; Keay: 153 (1954); Cavaco: 167 (1962).

Mat-forming, glabrous, fleshy herbs. **Leaves** opposite, linear to narrowly spathulate, amplexicaul at base. **Inflorescence** axillary or terminal, dense, capitate or cylindric spikes. **Flowers** bisexual, strongly dorsally compressed, subtended by white, 1-nerved bracts. **Tepals** 5, inner 2 smaller and concave. **Stamens** 5; filaments widening and fused into a cup below; anthers 1-thecous; pseudostaminodes absent. **Ovary** 1-ovulate; style very short; stigmas 2, filiform. **Capsule** thin-walled, indehiscent.

Species 4, tropical America, W Africa and Japan; sthn trop. Afr. 1: *Blutaparon vermiculare* (L.) Mears, Angola.

Celosia L.

Townsend: 1 (1975); Townsend: 81 (1982); Townsend: 30 (1988); Bingham & Smith: 140 (2002); Izidine & Bandeira: 49 (2002).

Sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Centema Hook.f.

Townsend: 70 (1988).

Sthn trop. Afr. 2, Angola, Mozambique, and sthn Afr.

Centemopsis Schinz

Schinz: 242 (1911); Cavaco: 71 (1962); Townsend: 74 (1988); Townsend: 83 (1993).

Achyropsis (Moq.) Hook.f., in part; *Psilotrichum* Blume, in part; *Robynsiella* Suess.

Annuals or short-lived perennials with tough, wiry stems. **Leaves** opposite, ± linear, entire. **Inflorescences** spiciform to capitate or cymose-fastigiate; bracts persistent, each subtending 1 or 2 flowers; bracteoles and perianth falling with fruit. **Flowers** bisexual. **Tepals** 5, indurate and ± coalescent at base in fruit, glabrous to sparingly floccose in lower half. **Stamens** 5, shortly fused at base, alternating with fringed staminodes; anthers 2-thecous. **Ovary** uni-ovulate, glabrous to thinly hairy; style slender; stigma capitate. **Capsule** thin-walled, indehiscent.

Species 11, trop. Africa; sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Centrostachys Wall.

Cavaco: 149 (1962) under *Achyropsis*; Townsend: 109 (1988).

Monotypic genus: *Centrostachys aquatica* (R.Br.) Wall. ex Moq., sthn trop. Afr.: Zambia, Zimbabwe, Mozambique, and sthn Afr.

Cyathula Blume

Cavaco: 84 (1962); Townsend: 79 (1988).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Gomphrena L.

Cavaco: 164 (1962); Townsend: 130 (1988).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr., widespread introduced weeds.

*Guilleminea Kunth

Townsend: 122 (1988).

Brayulinea Small; Cavaco: 156 (1962).

Sthn trop. Afr. 1: **Guilleminea densa* (Willd.) Moq., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr., widespread tropical weed, native of the Americas.

Hermbstaedtia Rchb.

Townsend: 81 (1982); Townsend: 39 (1988); Lebrun & Stork: 314 (2003).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Kyphocarpa (Fenzl) Lopr.

Cavaco: 70 (1962); Townsend: 62 (1988).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Leucosphaera Gilg

Townsend: 72 (1988).

Monotypic genus: *Leucosphaera bainesii* (Hook.f.) Gilg, Angola, Zimbabwe, and sthn Afr.

Marcelliopsis Schinz

Cavaco: 93 (1962); Lebrun & Stork: 316 (2003).

Sthn trop. Afr. 2, Angola, and sthn Afr.

Mechowia Schinz

Schinz: 105, 110 (1893); Cavaco: 108 (1962); Townsend: 99 (1988); Townsend: 86 (1993).

Perennial herbs with a stout rootstock and slender erect stems. **Leaves** opposite to alternate, broadly elliptic to almost filiform, entire. **Inflorescences** capitate, dense; bracts each subtending 1 flower, persistent after fruit falls; bracteoles deciduous with fruiting perianth. **Flowers** bisexual. **Tepals** 5, 3–5-nerved, free, glabrous. **Stamens** 5; filaments free, delicate, flattened; pseudostaminodes tooth-like or notched, alternating with stamens; anthers 2-thecous. **Ovary** uni-ovulate, densely lanate at least in upper two-thirds; style elongate; stigma capitate. **Capsule** thin-walled, irregularly dehiscent. **Seeds** somewhat compressed, yellow or reddish.

Species 2, Central Africa; sthn trop. Afr. 2, Angola, Zambia.

Nelsia Schinz

Bamps: 71 (1975); Townsend: 65 (1988).

Sthn trop. Afr. 2, Angola, and sthn Afr.

Nothosaerva Wight

Townsend: 97 (1988).

Monotypic genus: *Nothosaerva brachiata* (L.) Wight; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pandiaka (Moq.) Hook.f.

Cavaco: 129 (1962); Townsend: 115 (1988); Townsend: 87 (1993).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Psilotrichum Blume

Townsend: 101 (1988).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pupalia Juss.

Cavaco: 90, 220 (1962); Townsend: 88 (1988).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sericorema (Hook.f.) Lopr.

Townsend: 67 (1988).

Sthn trop. Afr. 2, Angola, Zimbabwe, and sthn Afr.

Sericostachys Gilg & Lopr.

Townsend: 42 (1985); Townsend: 60 (1988); White *et al.*: 121 (2001).

High-scandent perennials with opposite branches. **Leaves** opposite, broadly ovate to lanceolate-ovate, entire; indumentum of jointed, barbellate hairs. **Inflorescence** a broad panicle with spike-like branches; each persistent bract subtending a central, bisexual, fertile and 2 lateral sterile flowers, consisting of several hair-like appendages, elongating and imparting to infructescence branches a Clematis-like look. **Fertile flowers** bisexual, with 2 greatly accrescent bracteoles. **Tepals** 5, free, ± pilose. **Stamens** 5, very shortly fused into a disc-like rim at extreme base, alternating with very small pseudostaminodes; anthers 2-thecous. **Ovary** uni-ovulate, glabrous; style slender; stigma capitate. **Capsule** thin-walled, indehiscent, enclosed by and falling with persistent perianth and bracteoles.

Monotypic: *Sericostachys scandens* Gilg & Lopr., trop. Africa; sthn trop. Afr.: Angola, Malawi.

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Anacardiaceae
(Rosidae—Sapindales)
(Eurosids II—Sapindales)

Archer, R.H. in Leistner: 56 (2000).

Sthn trop. Afr.: genera 12, species ± 108.

**Spondias mombin* L., is cultivated and may be subspontaneous in Angola [Exell & Mendonça: 127 (1954/1956)].

Key to genera

[after Fernandes & Fernandes (1966)]

1a Leaves simple:
2a Style and stigma 1; male flowers with 1(2) fertile stamens, and staminodes ± developed; fruits large; leaf lamina glabrous; flowers polygamous:
3a Pedicel and receptacle swollen and fleshy in fruit, finally becoming larger than the fruit; fruit not fleshy, reniform, compressed; stamens 7–10 (usually only 1 fertile) with the filaments connate in a ring at the base ..... ***Anacardium**
3b Pedicel and receptacle not fleshy; drupe ovoid or subglobose, pulpy, stamens 5(10–12), 1(2–5) fertile, the others ± reduced, with the filaments not connate in a ring ..... ***Mangifera**
2b Styles 3, sometimes slightly connate at the base; male flowers with 5 stamens; fertile drupes black and shining, generally somewhat compressed, up to 13 mm broad, leaf lamina ± hairy; flowers dioecious ..... **Ozoroa**
1b Leaves compound (rarely 1-foliolate):
4a Hairs on the inflorescences (and usually on the young leaves) stellate; flowers 4-merous; stamens 8; styles 3 or 4, persistent in fruit ..... **Lannea**
4b Hairs (if present) simple:
5a Leaves 3-foliolate (very rarely 5-foliolate); drupes up to 8 mm in diam., globose or compressed; flowers (4)5(6)-merous with imbricate petals; ovary usually 1-locular and 1-seeded, styles 3; flowers dioecious ..... **Rhus**
5b Leaves pinnate or, if 1–3-foliolate, then drupes ellipsoid or ovoid:
6a Inflorescence spike-like; young leaves dentate; stamens more than 10 ..... **Sclerocarya**
6b Inflorescence paniculate; leaves entire to undulate; stamens 10 or less:
7a Style 1; ovary 1-locular and 1-seeded:
8a Flowers 5-merous, unisexual; stamens 10–20; petals valvate ..... **Sorindeia**
8b Flowers 3-merous, bisexual; stamens 6, unequal; petals imbricate ..... **Haematostaphis**
7b Styles several or stigmas sessile:
9a Ovary 5-locular; styles 5; stamens 10 ..... **Antrocaryon**
9b Ovary 1–4(5)-locular; styles 2–4(5); stamens 4–10:
10a Stamens 4(5); ovary hairy; stigmas 2-lobed ..... **Trichoscypha**
10b Stamens 6–10; ovary glabrous; stigmas truncate:
11a Ovary 3 or 4(5)-locular; flowers 3- or 4(5)-merous; sepals free ..... **Pseudospondias**
11b Ovary 1-locular; flowers 4- or 5-merous; sepals connate below ..... **Harpephyllum**

***Anacardium** L.

Hiern: 175 (1896); Exell & Mendonça: 96 (1954/1956); White: 208 (1962); Fernandes & Fernandes: 551 (1966); Fernandes & Fernandes: 2 (1969); Coates Palgrave: 539 (2002).

Species 11, tropical America; **Anacardium occidentale* L., the Cashew nut tree, is cultivated and is reported naturalised in Angola, Zambia, Zimbabwe and Mozambique, and in sthn Afr.

Antrocaryon Pierre

Pierre: 23 (1898); Engler: 177 (1921); Van der Veken: 63 (1960); Fernandes: 107 (1975).

Tall, dioecious to polygamous trees. **Leaves** alternate, imparipinnate with 5–9 pairs of ± oblong-lanceolate, entire leaflets with rounded base and long-acuminate apex. **Inflorescence** lax, subterminal-axillary panicles. **Male flowers**: calyx with 5 triangular, pubescent sepals; petals 5, oblong-ovate, reflexed, yellowish white; stamens 10, anthers ellipsoid, pistillode minute; disc thick, ± lobed. **Female flowers**: ovary subglobose, with 5 1-ovulate locules; styles 5, short, subterminal, diverging. **Fruit** a subglobose, somewhat horizontally flattened, weakly 5-lobed drupe with thin fleshy mesocarp and woody endocarp forming a nut with 5 elliptic, subapical operculums corresponding to the 5 locules. **Seeds** 3 or 4 per nut, oblong, flattened, curved; testa thin.

Species 3, trop. Africa; sthn trop. Afr. 1 or 2, Angola.

Haematostaphis Hook.f.

Hooker: 169 (1860); Engler: 186 (1921); Exell: 91 (1928); Exell & Mendonça: 130 (1954/1956); Keay: 733 (1958).

Tall, erect, dioecious trees. **Leaves** alternate, imparipinnate with many leaflets, glabrous, crowded towards ends of branches. **Inflorescence** elongate, laxly branching axillary panicles longer than leaves; flowers small. **Calyx** unequally 3-fid; sepals obtuse. **Petals** 3, obovate-oblong, imbricate. **Stamens** 6, unequal, alternately longer, all fertile. **Ovary** 1(2)-locular; style 1. **Fruit** an oblong, crimson, edible drupe with resinous mesocarp and 1(2)-locular, 1-seeded, bony endocarp. **Seed** pendulous with curved, fleshy cotyledons and a minute radicle.

Species 2, trop. Africa; sthn trop. Afr. 1: *Haematostaphis barteri* Hook.f., Angola.

Harpephyllum Bernh.

Fernandes & Fernandes: 555 (1966); Fernandes & Fernandes: 7 (1969); Coates Palgrave: 540 (2002).

Sthn trop. Afr. 1: *Harpephyllum caffrum* Bernh. in C.Krauss, Zimbabwe, Mozambique, and sthn Afr.; probably introduced from sthn Afr.

Lannea A.Rich.

Exell & Mendonça: 131 (1954/1956); White: 209 (1962); Fernandes & Fernandes: 557 (1966); Fernandes & Fernandes: 8 (1969); Kokwaro: 10 (1986); Coates Palgrave: 541 (2002).

Calesiam Adans.; Hiern: 177 (1896); *Odina* Roxb.; White: 211 (1962) as synonym.

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Mangifera L.

Exell & Mendonça: 96 (1954/1956); White: 211 (1962); Fernandes & Fernandes: 552 (1966); Fernandes & Fernandes: 4 (1969); Coates Palgrave: 539 (2002).

Species ± 40–60, Indomalesia; **Mangifera indica* L., the Mango, is cultivated in all warm regions of the world and is cited from all countries in sthn trop. Afr., and in sthn Afr.; it often becomes naturalised.

Ozoroa Delile

Fernandes & Fernandes: 574 (1966); Fernandes & Fernandes: 22 (1969); Izidine & Bandeira: 49 (2002).

Heeria, in part, not of Meisn.; Meikle: 116 (1954);White: 208 (1962); Coates Palgrave: 548 (2002).

Sthn trop. Afr. 26, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pseudospondias Engl.

Engler: 258 (1883); Exell & Mendonça: 128 (1954/1956); Fernandes & Fernandes: 555 (1966); Fernandes: 13 (1973).

Dioecious trees or tall shrubs; bole usually short, twisted, strongly buttressed; bark greyish yellow, falling off in large flakes. **Leaves** alternate, imparipinnate, leaflets opposite or alternate, oblong-ovate to elliptic, asymmetric at base, petiolulate, discolorous, sometimes shining, with secondary nerves curved. **Flowers** unisexual, in axillary, much branched and lax, many-flowered panicles. **Male flowers**: sepals 3 or 4(5), imbricate; petals 3 or 4(5), imbrieate; stamens 6–8(10), episepalous ones slightly longer, inserted below annular crenulate disc; vestigial ovary 3- or 4- lobulate, at centre of disc. **Female flowers**: ± similar to male ones, with small staminodes; ovary globose, 3- or 4(5)-locular; styles 3 or 4(5), subterminal, very short. **Drupe** oblong-obovoid with resinous mesocarp and woody endocarp, 3- or 4(5)-operculate at apex, usually with only 1 locule fertile. **Seeds** 1(2), oblong; testa thin; cotyledons plano-convex.

Species 2, W and C trop. Africa; sthn trop. Afr. 2, Angola, Zambia. Fruit edible, very sweet.

Rhus L.

Oliver: 436 (1868); Exell & Mendonça: 98 (1954/1956); White: 211 (1962); Fernandes & Fernandes: 590 (1966); Fernandes & Fernandes: 35 (1969); White *et al.*: 122 (2001); Coates Palgrave: 556 (2002).

Sthn trop. Afr. ± 45, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sclerocarya Hochst.

Oliver: 449 (1868); Exell & Mendonça: 130 (1954/1956); Fernandes & Fernandes: 552 (1966); Fernandes & Fernandes: 5 (1969); Coates Palgrave: 539 (2002).

Sthn trop. Afr. 1: *Sclerocarya birrea* (A.Rich.) Hochst. subsp. *caffra* (Sond.) Kokwaro, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sorindeia Thouars

Thouars: 23 (1806); Exell & Mendonça: 97 (1954/1956); Fernandes & Fernandes: 567 (1966); Fernandes & Fernandes: 17 (1969); White *et al.*: 125 (2001); Coates Palgrave: 544 (2002); Breteler: 93 (2003).

Shrubs, sometimes with stems in form of runners, or trees, dioecious, with light exudate. **Leaves** alternate, imparipinnate or rarely 1-foliolate; leaflets (1)3–7(9), petiolulate; tertiary nerves generally collected into an oblique nerve directed towards angle between midrib and lateral nerves. **Flowers** unisexual, 5-merous, in axillary or terminal branched panicles. **Male flowers**: calyx ± cupuliform, shallowly 5-lobulate or 5-dentate; petals valvate, or sometimes imbricate, longer than calyx; stamens 10–20; filaments subulate, inserted below and on dise; anthers dorsifixed, introrse; disc crenulated, glabrous; pistillode absent. **Female flowers**: perianth similar to male; staminodes usually 5, small; ovary free, 1-locular, ovoid; ovule 1, pendent, apical; style 1; stigma 3-lobed, persisting on fruit. **Drupe** ellipsoid or asymmetrically ovoid; mesocarp thin, fleshy; endocarp chartaceous or woody. **Seed** ellipsoid.

Species 9, trop. Africa, Madagascar, Mascarene and Comoro Islands; sthn trop. Afr. 3, Angola, Zambia, Malawi, Mozambique.

Trichoscypha Hook.f.

Hooker: 423 (1862); Exell & Mendonça: 123 (1954/1956); Van der Veken: 69 (1960); Fernandes & Fernandes: 571 (1966); Fernandes & Fernandes: 20 (1969); Fernandes: 16 (1973); White *et al.*: 125 (2001); Coates Palgrave: 544 (2002); Mapaura & Timberlake: 161 (2002).

Dioecious shrubs or trees; branchlets brownish, striate, lenticellate. **Leaves** alternate, imparipinnate, (1)2–11-foliolate; petiole and rachis brownish; leaflets opposite, subopposite or alternate, concolorous, petiolulate. **Flowers** unisexual, in many-flowered panicles, female ones usually shorter and with thicker axis than in males. **Calyx** shortly cupuliform, with 4(5) triangular-ovate lobes, valvate in bud. **Petals** 4(5), patent, later reflexed, valvate, those of female flowers slightly larger. **Stamens** 4(5), smaller and sterile in female flowers; filaments filiform; anthers dorsifixed. **Disc** cupuliform, ferruginous-hirsute or glabrous. **Ovary** ovoid, 1-locular, 1-ovulate; styles 3 or 4, reflexed or erect, compressed, with 2-lobed stigmas (rarely sessile). **Drupe** ovoid, turbinate or subglobose, appressed-setulose or glabrous; exocarp and mesocarp ± fleshy; endocarp thin, coriaceous or crustaceous. **Seed** ovoid, with very thick cotyledons.

Species 50, trop. Africa; sthn trop. Afr. 5 or 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

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Anisophylleaceae

(Rosidae—Rosales)
(Eurosids I—Cucurbitales)

Trees, shrubs or subshrubs, sometimes polygamous, usually glabrous or glabrescent, young shoots often pubescent or pilose; without aerial roots. **Leaves** alternate, generally distichous and horizontally orientated on horizontally growing branches, simple, ± elliptic, entire, often inequilateral, with ± 26 lateral nerves curving up from near base and soon becoming subparallel; petiole short; stipules 0 but often with alternating reduced, stipuliform leaves. **Inflorescences** many-flowered spikes. **Flowers** bisexual or unisexual, regular, small. **Calyx** (3)4 or 5(–7)-lobed; lobes ± erect; tube adnate to ovary. **Petals** usually as many as, and scarcely longer than calyx lobes, free, arising at mouth of calyx tube, lobed or laciniate, rarely entire. **Disc** obscure, crenulated or lobed. **Stamens** twice as many as petals, arising at mouth of calyx tube or epipetalous ones adnate to basal parts of petals; filaments usually unequal in length; anthers 2-thecous, dorsifixed, introrse or latrorse, opening by longitudinal slits, didynamous, small. **Ovary** inferior, (3)4(–8)-locular, each locule with 1 apical-axile, pendulous, anatropous, unitegmic, crassinucellate ovule; styles as many as locules, ± free, short, ± thickened below, erect or recurved, arising from disc. **Fruit** an ellipsoid to pyriform drupe, usually 1-locular and 1-seeded. **Seed** with leathery testa; embryo linear to slightly fusiform, longitudinally embedded in seed, cotyledons minute or absent; albumen thick and hard; endosperm 0.

Genera 4, species ± 30, tropics of Old and New World. Anisophylleaceae have often been placed under Rhizophoraceae from which they differ as follows: leaves alternate, often distichous; stipules 0; inflorescences catkin- or spike-like; styles (3)4(–8), ± free (stylodia). Sthn trop. Afr.: genus 1, species ± 5.

Ridley: 700 (1922); Dahlgren: 1259 (1988); Takhtajan: 278 (1997); Angiosperm Phylogeny Group: 426 (2003).

Anisophyllea R.Br. ex Sabine

Sabine: 446 (1824); Exell: 163 (1928) under Rhizophoraceae; Keay: 281 (1954); Lewis: 16 (1956); Burtt Davy *et al.*: 82 (1958) under Rhizophoraceae; White: 275 (1962) under Rhizophoraceae; Mendes: 40 (1970) under Rhizophoraceae; Torre & Gonçalves: 96 (1978) under Rhizophoraceae.

Description as for family.

Species ± 25, tropics of Old World; sthn trop. Afr. ± 5, Angola, Zambia, Malawi.

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Annonaceae
(Magnoliidae—Magnoliales)
(Magnoliids—Magnoliales)

Jordaan, M. in Leistner: 59 (2000).

Sthn trop. Afr.: genera 29, species 101.

Key to genera

[adapted from Kessler (1993)]

1a Climbing plants:
2a Stellate hairs present:
3a Ovules 1 per carpel; monocarps connate ..... **Letestudoxa**
3b Ovules many to few per carpel; monocarps free ..... **Uvaria**
2b Simple hairs present or plants glabrous:
4a Climbers with leaf-opposed, laterally compressed hooks; ovules 2, basal; monocarps free ..... **Artabotrys**
4b Climbers without hooks:
5a Petals in 2 subequal whorls, or petals in 1 whorl:
6a Petals in 1 whorl, 4–6, without appendages at top ..... **Monanthotaxis**
6b Petals in 2 whorls:
7a Petals, at least outer whorl, valvate ..... **Sphaerocoryne**
7b Petals imbricate:
8a Androgynophore absent or very short ..... **Afroguatteria**
8b Androgynophore up to 13 mm long ..... **Toussaintia**
5b Outer petals larger than inner ones:
9a Stamens with apex of connective expanded-truncate:
10a Stamens 12–15, in 2 whorls; carpels 3 ..... **Exellia**
10b Stamens many; carpels many:
11a Inner petals slightly shorter than outer ones, not concave at base; sepals persistent in fruit ..... **Sphaerocoryne**
11b Inner petals much shorter than outer ones, not concave at base; sepals not persistent in fruit ..... **Friesodielsia**
9b Stamens with apex of connective either not enlarged or tongue-shaped or conical, never truncate:
12a Anther thecae transversely septate ..... **Neostenanthera**
12b Anther thecae not transversely septate ..... **Monanthotaxis**
1b Erect trees or shrubs:
13a Hairs stellate:
14a Petals 3 in 1 whorl ..... **Annickia** (=*Enantia*)
14b Petals 6 in 2 whorls:
15a Carpel 1; ovules many ..... **Dielsiothamnus**
15b Carpels several; ovules 1 or 2:
16a Inner petals eaudate at apex; carpels connate at the base, enclosed by the receptacle; ovule 1, basal ..... **Duguetia**
16b Inner petals not caudate; carpels free; ovules many to 1, lateral ..... **Uvaria**
13b Hairs simple or plants glabrous:
17a Petals equal to subequal, mostly in 2 whorls, sometimes in 1:
18a Inner petals clawed ..... **Uvariodendron**
18b Inner petals not clawed:
19a Stamens with an enlarged connective apex, or connective apex tongue-shaped or conical, never truncate:
20a Sepals 2, connate to form a bilobed apex; petals 4(3), in 1 whorl ..... **Uvariopsis**
20b Sepals 3; petals 6, in 2 whorls:
21a Stamens with connective not developed above the anthers, replaced by a tuft of hairs ..... **Mischogyne**
21b Stamens with connective apex conical to capitate, tongue-shaped, sometimes toothed:
22a Petals transversely folded in bud; monocarps subsessile ..... **Hexalobus**
22b Petals not transversely folded; monocarps stipitate ..... **Greenwayodendron**

19b Stamens with apex of connective expanded-truncate:
23a Petals in 1 whorl:
24a Petals 3 ..... **Annona**
24b Petals 6; sepals 3 free, carpels united into a 1-locular ovary ..... **Isolona**
23b Petals in 2 distinct whorls:
25a Fruit formed by the united monocarps ..... **Annona**
25b Fruit formed by free monocarps:
26a Anther thecae transversely septate ..... **Xylopia**
26b Anther thecae not transversely septate:
27a Ovule 1, basal ..... **Polyalthia**
27b Ovules several, lateral, in two series; petals joined at the base; stigma cushion-shaped ..... **Polyceratocarpus**
17b Petals of the 2 whorls dissimilar or 1 whorl missing:
28a Outer petals shorter than inner ones ..... **Piptostigma**
28b Inner petals shorter than outer ones or inner whorl missing:
29a Inner whorl of petals absent ..... **Annona**
29b Inner whorl of petals present:
30a Inner petals clawed or concave at the base:
31a Inner petals clawed:
32a Carpels several, united into a conical or globose 1-celled ovary with many ovules and parietal placentation ..... **Monodora**
32b Carpels several, free ..... **Monanthotaxis**
31b Inner petals concave at the base:
33a Anther thecae not transversely septate ..... **Cleistopholis**
33b Anther thecae transversely septate:
34a Apex of the anther connective expanded-truncate ..... **Xylopia**
34b Apex of the anther connective triangular; monocarps stipitate ..... **Neostenanthera**
30b Inner petals neither clawed nor concave at base:
35a Ovule 1, basal:
36a Fruit formed by the united carpels ..... **Anonidium**
36b Monocarps free:
37a Calyx entire; inner petals not cohering about the reproductive organs ..... **Cleistochlamys**
37b Calyx of 3 sepals ± connate at base; inner petals cohering about the reproductive organs:
38a Inner petals slightly shorter than outer ones; sepals persistent in fruit ..... **Sphaerocoryne**
38b Inner petals much shorter than outer ones; sepals not persistent in fruit ..... **Friesodielsia**
35b Ovules many to few, lateral:
39a Monocarps sessile; stigma sessile, cushion-shaped; seeds without aril ..... **Polyceratocarpus**
39b Monocarps stipitate:
40a Inner petals not cohering about the reproductive organs ..... **Uvariastrum**
40b Inner petals cohering about the reproductive organs:
41a Inner petals slightly shorter than outer ones; sepals persistent in fruit ..... **Sphaerocoryne**
41b Inner petals much shorter than outer ones; sepals not persistent in fruit ..... **Friesodielsia**

Afroguatteria Boutique

Boutique: 104 (1951a); Boutique: 298 (1951b); Paiva: 24 (1966); Kessler: 112 (1993); Lebrun & Stork: 22 (2003).

Climber, up to 4 m long, with simple hairs. **Leaves** elliptic-oblong to oblong-obovate, petiolate. **Flowers** bisexual, solitary or in 2-flowered cymes, leaf-opposed; buds subglobose; bracteole 1, caducous. **Sepals** 3, free, valvate. **Petals** 6, imbricate, in 2 whorls, subequal. **Stamens** many, connective with a dilated capitate apex. **Carpels** many, free, cylindric, ± angular, 1(2)-ovulate. **Fruit** a fusiform, stipitate monocarp.

Species 2, trop. Africa; sthn trop. Afr. 1: *Afroguatteria globosa* Paiva, Angola (Cabinda).

Annickia Setten & Maas

Setten & Maas: 676, 681 (1990).

Enantia Oliver: 174 (1867) not of Falconer (1841) in Sabiaceae; Exell & Mendonça: 26 (1937/1951); Boutique: 386 (1951b); Le Thomas: 300 (1962); Paiva: 97 (1966); Le Thomas: 306 (1969); Kessler: 117 (1993).

Trees with simple, fasciculate or stellate hairs. **Flowers** bisexual, solitary or rarely paired, extra-axillary; buds conical; bracteoles 1 or 2, caducous. **Sepals** 3, free, valvate, lanceolate. **Petals** 3, opposite sepals, free, valvate. **Stamens** many, connective with an ovoid, subpyramidal or truncate, dilated apex. **Carpels** many, free, usually cylindric, pubescent, with 1 basal ovule. **Fruit** an oblong to ellipsoid, stipitate monocarp.

Species ± 12, trop. Africa; sthn trop. Afr. 2: Angola (Cabinda).

Annona L.

Exell & Mendonça: 27, 356 (1937/1951); Robson: 141 (1960); White: 51 (1962); Paiva: 107 (1966); Paiva: 185 (1983–84); Coates Palgrave: 210 (2002); Lebrun & Stork: 22 (2003).

Sthn trop. Afr.: 3 indigenous, 4 introduced, cultivated and sometimes subspontaneous, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anonidium Engl. & Diels

Engler & Diels: 50, 56 (1900); Exell & Mendonça: 15 (1937/1951); Paiva:

106 (1966); Le Thomas: 328 (1969); Paiva: 184 (1983–84); Kessler: 126 (1993).

Trees with simple hairs. **Flowers** bisexual or male, in fascicles, cauliflorous; buds subglobose; bracts cucullate; bracteoles 2. **Sepals** 3, connate at base, valvate. **Petals** 6, in 2 whorls, exterior ones valvate, interior ones imbricate. **Stamens** many, thecae linear, extrorse; connective with a truncate, dilated apex. **Carpels** many, with bases included in receptacle; ovule 1, basal. **Fruit** compound, fleshy, ± globose-ovoid, formed by united monocarps.

Species ± 5, trop. Africa; sthn trop. Afr. 1: *Anonidium mannii* (Oliv.) Engl. & Diels var. *brieyi* (De Wild.) Fries (=*A. friesianum* Exell), Angola (Cabinda).

Artabotrys R.Br.

Exell & Mendonça: 21, 355 (1937/1951); Robson: 129 (1960); White: 51 (1962); Paiva: 88 (1966); Kessler: 117 (1993); White *et al.*: 127 (2001); Coates Palgrave: 209 (2002); Mapaura & Timberlake: 171 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cleistochlamys Oliv.

Oliver: 175 (1867); Robson: 120 (1960); White: 52 (1962); Kessler: 117 (1993); Coates Palgrave: 204 (2002).

Shrub or small tree, ereet or straggling, much-branched, with simple hairs; bark pale, flaking. **Leaves** petiolate, narrowly oblong to oblanceolate or obovate. **Flowers** bisexual, solitary, axillary, sessile; buds globose; bracteoles 4 or 5, biseriate, persistent. **Calyx** entire and completely enclosing petals in bud, splitting into 3 (rarely 2) ± equal sepals, glabrous. **Petals** 6, in two whorls, outer valvate, inner imbricate and somewhat shorter, expanding and spreading at anthesis, free. **Stamens** ± 30–40, cuneate-quadrate, with thecae extrorse, divergent and prolongation of connective broadly and obliquely capitate; filaments absent or almost so. **Carpels** 6–10, free, ovoid, with a single basal ovule; style cylindric, oblique, almost as long as ovary; stigma capitate; ripe carpels indehiscent, succulent, cylindric, stipitate, 1-seeded. **Seed** vertical; aril absent.

Monotypic genus: *Cleistochlamys kirkii* (Benth.) Oliv. is confined to Tanzania and the adjacent sthn trop. Afr. regions of Zambia, Zimbabwe, Malawi and Mozambique. The genus is near *Monanthotaxis*, but is distinguished from it by the entire calyx.

Cleistopholis Pierre ex Engl.

Engler: 160 (1897); Exell & Mendonça: 14 (1937/1951); Paiva: 26 (1966); Le Thomas: 87 (1969); Kessler: 113 (1993).

Trees, glabrous or glabrescent (with simple hairs). **Flowers** bisexual, in fascicles, axillary; buds subglobose or conical. **Sepals** 3, free, valvate. **Petals** 6, in 2 whorls, outer ones valvate, inner ones imbricate, smaller than inner ones. **Stamens** many, sessile; thecae linear, extrorse; connective with a truncate, dilated apex. **Carpels** 10–many, free, oblong-linear, 1- or 2-ovulate. **Mericarps** baccate, subglobose, subsessile. **Seeds** 1 or 2, usually vertical, globose or plano-convex. $x = 7$.

Species 3(4), W trop. Africa; sthn trop. Afr. 2, Angola (Cabinda).

Dielsiothamnus R.E.Fr.

Fries: 35 (1955); Robson: 115 (1960); Kessler: 121 (1993).

Shrubs or small trees, sometimes climbing, with stellate and sparse simple hairs. **Flowers** bisexual (rarely male), solitary, axillary, shortly pedicellate; buds globose; bracteoles 2, enclosing bud. **Sepals** 3, valvate, enclosing petals in bud. **Petals** 6, in 2 whorls, both valvate, free, outer whorl slightly larger. **Stamens** many, linear-obconic with thecae lateral and connective-prolongations obliquely capitate, apiculate; filaments short. **Carpel** solitary, cylindric, with many ovules in two rows; style absent; stigma bilobed; ripe carpel indehiscent, sessile or subsessile, many-seeded. **Seeds** horizontal; aril absent.

Monotypic genus: *Dielsiothamnus divaricatus* (Diels) R.E.Fr. is apparently restricted to Tanzania in trop. Africa, and to Malawi and Mozambique in sthn trop. Afr. The genus has affinities with *Uvaria* and *Hexalobus*.

Duguetia A.St-Hil.

Saint-Hilaire: 35 (1824); Kessler: 127 (1993); Chatrou *et al.*: 234 (2000); Lebrun & Stork: 30 (2003).

Pachypodanthium Engl. & Diels: 50, 55 (1900) in part; Paiva: 29 (1966); Le Thomas: 102 (1969); Kessler: 127 (1993).

Trees with stellate hairs. **Flowers** bisexual, solitary, paired or in few-flowered fascicles on short thick branches; bracts many, caducous; receptacle conical. **Sepals** 3, valvate, free. **Petals** 6, in 2 whorls, imbricate, inner slightly shorter than outer ones and caudate at apex. **Stamens** many, connective truncate at apex. **Carpels** many, connate at base and enclosed by receptacle; ovule 1, basal. **Fruit** a globose, to subglobose-ellipsoid syncarp composed of united monocarps.

Species ± 100, tropics of the New World and W Africa; sthn trop. Afr, 1: *Duguetia confinis* (Engl. & Diels) Chatrou, Angola (Cabinda).

Exellia Boutique

Boutique: 117 (1951a); Exell & Mendonça: 356 (1937/1951); Paiva: 46 (1966); Le Thomas: 262 (1969); Kessler: 115 (1993).

Climbers with simple hairs. **Flowers** unisexual, solitary or paired, axillary or extra-axillary, rarely terminal; buds subglobular; bracteoles 1. **Sepals** 3, valvate, ± united at base, much smaller than petals. **Petals** 6, free, valvate, in 2 whorls, inner ones smaller than outer ones, shortly clawed. **Stamens** 12–15, in 2 whorls; thecae lateral, longitudinally dehiscent; connective with truncate dilated apex. **Carpels** 3, free, cylindric-obconical; ovules 15–20, in 2 series; style absent; stigma conical. **Monocarps** 1(–3), globose, indehiscent, sessile, many-seeded.

Monotypic: *Exellia scannopetala* (Exell) Boutique, W Africa; sthn trop. Afr.: Angola (Cabinda).

Friesodielsia Steenis

Le Thomas: 233 (1969); Verdcourt: 17 (1971a); Verdcourt: 86 (1971b); Paiva: 181 (1983–84); Kessler: 120 (1993); Coates Palgrave: 205 (2002).

Oxymitra (Blume) Hook.f. & Thompson.

Species ± 50–60, tropical Asia and Africa. According to Verdcourt (1971a)

the African species are probably not properly placed in this genus; *Friesodielsia obovata* (Benth.) Verdc. has been recorded in sthn trop. Afr. from Angola, Zambia, Zimbabwe, Malawi, Mozambique, and in sthn Afr.

Greenwayodendron Verdc.

Verdcourt: 89 (1969); Paiva: 179 (1983–84); Kessler: 113 (1993).

Polyalthia Blume sect. *Afropolyalthia* Engl. & Diels; Boutique: 339 (1951b).

Tall trees with simple hairs. **Flowers** unisexual or bisexual, solitary or in few-flowered fascicles, leaf-opposed. **Sepals** 3, slightly imbricate. **Petals** 6, in 2 whorls, outer ones valvate, inner ones imbricate, subequal. **Stamens** numerous in male flowers, few in female flowers; filaments linear to linear-oblong; anthers extrorse, connectives with an ovate, oblong, tongue-shaped, sometimes tooth-shaped apex. **Carpels** 10–20, free, 1–3-ovulate; style obsolete; stigma compressed-globose to rhomboid, obscurely lobed. **Monocarps** 2–18, indehiscent, globose, distinctly stipitate.

Species 2, trop. Africa; sthn trop. Afr. 1: *Greenwayodendron suaveolens* (Engl. & Diels) Verdc., Angola (Cabinda).

Hexalobus A.DC.

Exell & Mendonça: 16, 354 (1937/1951); Robson: 116 (1960); White: 52 (1962); Paiva: 61 (1966); Le Thomas: 81 (1969); Verdcourt: 44 (1971b); Kessler: 113 (1993); Coates Palgrave: 207 (2002); Izidine & Bandeira: 49 (2002) as *Hexabolus*; Lebrun & Stork: 32 (2003).

Species 5, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Its gamopetalous corolla, with lobes plicate in bud, provides a good "spot" character.

Isolona Engl.

Engler: 161 (1897); Exell & Mendonça: 31 (1937/1951); Paiva: 116 (1966); Le Thomas: 349 (1969); Verdcourt: 124 (1971b); Paiva: 185 (1983–84); Kessler: 128 (1993).

Trees or shrubs, glabrous or with simple hairs. **Flowers** bisexual, solitary, or paired, axillary, extra-axillary or cauliflorous; buds ovoid-subglobose; bracteoles 3 or 4, small; receptacle convex. **Sepals** 3, valvate, small. **Petals** 6, equal, valvate, in 1 whorl, fused at base into a tube. **Stamens** many, in 3 or 4 whorls; filaments short or absent; connective with a truncate, dilated apex. **Carpels** united into a 1-locular ovary; ovules many; placentation parietal. **Fruit** a globose to ellipsoid, stipitate syncarp with a dry to woody pericarp. $x = 8$.

Species ± 22, trop. Africa and Madagascar; sthn trop. Afr. 2: Angola.

Letestudoxa Pellegr.

Pellegrin: 654 (1920); Le Thomas: 96 (1969); Paiva: 179 (1983–84); Kessler: 127 (1993).

Pachypodanthium Engl. & Diels, in part; Exell & Mendonça: 15 (1937/1951).

Climbers with simple or fascicled hairs. **Flowers** bisexual, solitary, extra-axillary or ± leaf-opposed; buds globular to ovoid; receptacle convex. **Sepals** united into a calyptra, falling off by a circular slit. **Petals** 6, imbricate, in 2 whorls, free, ± equal. **Stamens** very many, sessile; connective with a truncate dilated apex. **Carpels** many; ovary ± cylindric, with base included in receptacle; ovule 1, basal. **Fruit** a globose syncarp with mericarps joined in their lower quarter.

Species 2, W Africa; sthn trop. Afr. 1: *Letestudoxa bella* Pellegrin, Angola (Cabinda).

Mischogyne Exell

Exell: 213 (1932); Exell & Mendonça: 30, 356 (1937/1951); Paiva: 104 (1966); Le Thomas: 284 (1969); Kessler: 123 (1993).

Shrubs with simple hairs. **Flowers** bisexual, in axillary or extra-axillary fascicles; buds ovoid to ellipsoid; receptacle long-cylindric. **Sepals** 3, valvate, shortly connate at base. **Petals** 6, valvate, in 2 whorls, subequal. **Stamens** many; connective without a prolonged apex. **Carpels** 4–40, free, cylindric, stigmas bilobed; ovules many, 2-seriate.

Species 2; sthn trop. Afr. 1: *Mischogyne michelioides* Exell, Gabon; Angola.

Monanthotaxis Baill.

Exell & Mendonça: 22 (1937/1951); Paiva: 56 (1966); Verdcourt: 20 (1971a); Paiva: 179 (1983–84); Kessler: 123 (1993); White *et al.*: 128 (2001); Coates Palgrave: 206 (2002); Mapaura & Timberlake: 161 (2002); Lebrun & Stork: 36 (2003).

Enneastemon Exell: 209, t. 1 (1932); Exell & Mendonça: 26 (1937/1951); Robson: 128 (1960); White: 52 (1962); Paiva: 58 (1966), conserved name. *Popowia* in sense of many authors, not of Endlicher (1839); Exell & Mendonça: 23 (1937/1951); Robson: 122 (1960); White: 52 (1962); Paiva: 34 (1966).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Monodora Dunal

Exell & Mendonça: 31, 356 (1937/1951); Robson: 145 (1960); Paiva: 119 (1966); Kessler: 128 (1993); Coates Palgrave: 211 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Neostenanthera Exell

Exell: 5 (1935); Exell: 26 (1937/1951); Paiva: 86 (1966); Le Thomas: 189 (1969); Paiva: 183 (1983–84); Kessler: 118 (1993); Martins: 58 (1994).

Erect trees with simple hairs. **Flowers** bisexual, solitary or in fascicles, extra-axillary or leaf-opposed; bracteole minute. **Sepals** 3, valvate. **Petals** 6, valvate, in 2 whorls, outer ones longer than inner ones, inner concave at base, spoon-shaped. **Stamens** many, connective with triangular apex; anther cells transversely septate. **Carpels** many, free, cylindric, with 1 basal ovule. **Monocarps** fusiform, stipitate. $x = 8$.

Species 5, tropical America and Africa; sthn trop. Afr. 1: *Neostenanthera gabonensis* (Engl. & Diels) Exell (=*N. micrantha* Exell), Angola (Cabinda).

Piptostigma Oliv.

Oliver: 158 (1865); Exell & Mendonça: 16 (1937/1951); Paiva: 100 (1966); Le Thomas: 111 (1969); Kessler: 115 (1993).

Brieya De Wild.; Exell: 11 (1926); Boutique: 304 (1951b).

Trees or small trees with simple hairs. **Flowers** bisexual, solitary, in few-flowered fascicles or in panicles, sometimes cauliflorous; buds conical or subglobose. **Sepals** 3, valvate, free. **Petals** 6, in 2 whorls, valvate, outer ones much shorter than inner ones and ± equal to sepals, inner ones concave at base. **Stamens** many, connectives with truncate, dilated apex; filaments very short to absent. **Carpels** 2–8, free, cylindric or ± prismatic, with 4–20 ovules in 2 series. **Fruit** of monocarps free or ± united at base, cylindric-ellipsoid, fleshy, indehiscent. **Seeds** ± horizontal, ellipsoid.

Species 14, trop. Africa; sthn trop. Afr. 3, Angola.

Polyalthia Blume

Blume: 68 (1830); Exell & Mendonça: 22 (1937/1951); Paiva: 32 (1966); Le Thomas: 199 (1969); Paiva: 369 (1970); Vollesen: 403 (1980); Kessler: 114 (1993); Bingham (Unpublished).

Trees, shrubs or undershrubs, sometimes polygamous. **Leaves** glabrous or with simple hairs. **Flowers** bisexual, or sometimes unisexual, solitary or in 2–several-flowered axillary or extra-axillary fascicles, leaf-opposed or supra-axillary; bracts and bracteoles present. **Sepals** 3, free or united at base, valvate or very slightly imbricate, much shorter than petals. **Petals** 6, free, valvate, in 2 equal or ± unequal whorls. **Stamens** usually many, free or united at base, cuneate, with flat-topped or slightly convex connectives. **Carpels** many, free; ovules 1 basal or 2(–5) lateral; style nearly always absent; stigma subcapitate, globose or irregularly shaped. **Monocarps** few to many, globose to ovoid, indehiscent, mostly stipitate. **Seeds** horizontal.

Species 100, Old World tropics; sthn trop. Afr. 2, Angola (Cabinda), Zambia (exotic), Mozambique.

Polyceratocarpus Engl. & Diels

Engler & Diels: 56 (1900); Paiva: 48 (1966); Le Thomas: 269 (1969); Kessler: 116 (1993).

Trees or shrubs with simple hairs. **Flowers** bisexual or male, solitary or paired, axillary or extra-axillary, sometimes cauliflorous; buds subglobose; bracteoles present; receptacle subglobose or shortly cylindric. **Sepals** 3, united at base, valvate, much smaller than petals. **Petals** 6, free, in 2 valvate whorls, subequal or outer ones slightly longer than inner ones. **Stamens** many, linear to cuniform, subsessile; connective with a capitate or truncate, dilated apex. **Carpels** 4–20, free, oblong-cylindric; ovules ± 20, in 2 series. **Monocarps** cylindric, sessile or subsessile, slightly constricted between seeds.

Species ± 7, tropical W Africa; sthn trop. Afr. 3: Angola (Cabinda).

Sphaerocoryne (Boerl.) Scheff. ex Ridl.

Ridley: 8 (1917); Verdcourt: 293 (1986); Coates Palgrave: 205 (2002); Lebrun & Stork: 48 (2003).

Melodorum in sense of Verdcourt: 83 (1971b); Paiva: 181 (1983–84); Kessler: 119 (1993).

Shrubs, small trees or climbing shrubs; branchlets black, glabrescent or with sparse simple hairs, rarely densely velvety but soon glabrous. **Leaves**: bases of petioles ± prominent; blades oblong-ovate or obovate, acuminate at apex, cuneate at base, dark green and sometimes glossy above. **Flowers** bisexual, solitary or paired, terminal or axillary, stalked; bracteole small. **Sepals** 3, free or ± connate, persistent in fruit. **Petals** 6, in 2 whorls, valvate or inner ones somewhat imbricate and slightly shorter than outer ones, remaining closed for long period. **Stamens** many; filaments not developed; connectives with obliquely capitate apex. **Carpels** 18–30, cylindric or oblong; ovules 1(2), near base. **Monocarps** ± 2–20, stipitate.

Sphaerocoryne gracile (Engl. & Diels) Verdc. from tropical East Africa and Angola, Zambia and Mozambique probably belongs to a new genus [Verdcourt: 293 (1986); Kessler: 120 (1993)].

Toussaintia Boutique

Boutique: 97 (1951a); Boutique: 278 (1951b); Le Thomas: 29 (1969); Kessler: 113 (1993); Lebrun & Stork: [48](2003).

Climbers with simple hairs. **Leaves** shortly petiolate, elliptic-oblong, with dense, fine reticulum. **Flowers** bisexual, solitary or in 2-flowered cymes, axillary or supra-axillary. **Sepals** 3, valvate. **Petals** 6–10, imbricate, in 2(3) whorls, subequal. **Torus** developed into an androgynophore. **Stamens** very many; filaments short; thecae linear, extrorse; connectives with a dilated, truncate apex; pollen in tetrads. **Carpels** many; ovules 14–20, in 2 rows; ripe carpels unknown.

Species 3, trop. Africa; sthn trop. Afr. 1: *Toussaintia congolensis* Boutique, Angola (Cabinda).

Uvaria L.

Exell & Mendonça: 11, 354 (1937/1951); Robson: 106 (1960); White: 53 (1962); Paiva: 10 (1966); Kessler: 111 (1993); Johnson *et al.*: 58 (1999); White *et al.*: 130 (2001); Bingham & Smith: 140 (2002); Coates Palgrave: 203 (2002); Mapaura & Timberlake: 171 (2002); Lebrun & Stork: 48 (2003).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Uvariastrum Engl.

Engler: 531 (1901); Robson: 112 (1960); White: 53 (1962); Paiva: 54 (1966); Le Thomas: 288 (1969); Kessler: 115 (1993).

Small trees, much branched, evergreen, glabrous or with simple hairs; bark flaking; branches pliant, pendulous. **Leaves** petiolate, elliptic to oblong or oblanceolate. **Flowers** bisexual (rarely unisexual), solitary or paired, axillary, sometimes on old wood; buds conic; bracteole 1, usually caducous. **Sepals** 3, valvate, free, enclosing petals and with margins folded to form 3 ± prominent longitudinal wings in bud, often densely brown-pubescent. **Petals** 6, in 2 whorls; inner whorl imbricate, expanding and spreading at anthesis, free, subequal; outer whorl usually slightly longer. **Stamens** many, linear, with thecae extrorse, and prolongations of connective ± capitate. **Carpels** 3-10 or sometimes more numerous, free, cylindric or obconic, sometimes ± angular, with many ovules in two rows; style very short or absent; stigma ± expanded, bilobed or irregular; ripe carpels indehiscent, succulent (? or sometimes dry), ellipsoid to cylindric, shortly stipitate, many- to few-seeded. **Seeds** ± horizontal; aril absent.

Species 8, trop. Africa; sthn trop. Afr. 1: *Uvariastrum hexaloboides* (R.E.Fr.)

R.E.Fr., Zambia. Can be distinguished from *Uvaria* by the axillary flowers and usually also by the valvate corolla and simple indumentum.

Uvariodendron (Engl. & Diels) R.E.Fr.

Fries: 51 (1930); Exell & Mendonça: 13 (1937/1951); Robson: 114 (1960); Paiva: 52 (1966); Le Thomas: 275 (1969); Paiva: 181 (1983–84); Kessler: 115 (1993); Izidine & Bandeira: 56 (2002).

Uvaria sect. *Uvariodendron* Engl. & Diels

Shrubs or trees, not climbing, with simple hairs. **Flowers** bisexual, solitary or paired, axillary, sometimes on old wood; buds depressed-globose; bracteoles 2–6, usually biseriate, forming an involucre in sessile flowers. **Sepals** 3, valvate, free or united at base, not enclosing petals in bud, with plane margins, densely brown- or golden-sericeous outside, glabrous within. **Petals** 6 in 2 whorls, outer valvate, inner valvate above and open below, expanding and spreading at anthesis or inner whorl remaining connivent at apex, free, subequal, thick. **Stamens** very many, linear, with thecae lateral or extrorse and prolongations of connective capitate. **Carpels** many, cylindric, with many ovules in 2 rows; style very short; stigma truncate, horseshoe-shaped; ripe carpels indehiscent, ovoid or ellipsoid to cylindric, straight, subsessile, many-seeded. **Seeds** ± horizontal; aril absent.

Species ± 12, trop. Africa; sthn trop. Afr. 1: *Uvariodendron molundense* (Engl. & Diels) R.E.Fr., Angola (Cabinda). An unnamed species is also recorded from Mozambique by Robson (1960). The genus differs from *Uvariastrum* in the shape of the buds and in the sepals, which do not enclose the petals in bud. It is closely related to *Polyceratocarpus* Engl. & Diels in which the inner petals are wholly contiguous and the fruits are usually curved.

Uvariopsis Engl.

Engler: 298 (1899); Exell & Mendonça: 356 (1937/1951); Robson: 119 (1960); White: 54 (1962); Paiva: 94 (1966); Le Thomas: 296 (1969); Kessler: 123 (1993); Gereau & Kenfack: 39 (2000).

Tetrastemma Diels ex H.Winkl.

Shrubs or trees, not climbing, with simple hairs; monoecious or dioecious. **Flowers** solitary or in fascicles, axillary, sometimes on old wood, pedicellate; female larger than male; bracteoles 2, respectively basal and median, ± persistent. **Sepals** 2, connate to form a bilobed or patelliform calyx, much shorter than petals in bud. **Petals** 4, in one whorl, valvate, expanding and spreading at anthesis, free or ± connate, subequal, thick. **Stamens** very many, oblong to oblong-obovoid, with thecae extrorse; prolongation of connective absent or very short; filaments absent or very short. **Carpels** many, free, obovoid, pubescent, with many biseriate ovules; stigma sessile, cylindric or depressed-obconic; ripe carpels indehiscent, succulent, cylindric or ellipsoid to obovoid, frequently constricted, stipitate, several-seeded. **Seeds** horizontal; aril absent.

Species 14, trop. Africa; sthn trop. Afr. 2, Angola, Zambia.

Xylopia L.

Exell & Mendonça: 16, 355 (1937/1951); Robson: 133 (1960); White: 54 (1962); Paiva: 66 (1966); Paiva: 182 (1983–84); Kessler: 117 (1993); Coates Palgrave: 207 (2002); Izidine & Bandeira: 49 (2002); Mapaura & Timberlake: 171 (2002).

Sthn trop. Afr. ± 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Aphloiaceae

(Dilleniidae—Violales)
(Eurosidae I—Malpighiales)

Trees or shrubs; cyanogenic glycosides absent. **Leaves** alternate, simple, narrowly elliptic or oblanceolate, serrated or sometimes incised, petiolate; stipules minute, caducous. **Inflorescences** axillary, few-flowered fascicles or racemes, or flowers solitary. **Flowers** bisexual, regular. **Sepals** 4 or 5(6), fused basally, imbricate, orbicular, concave, somewhat leathery. **Petals** 0. **Disc** and disc glands 0. **Stamens** many, arising outside or towards margin of disc; filaments free, terete, longer than sepals; anthers short, without appendages. **Ovary** superior, 1-locular, with few to several ovules on a single parietal placenta; style short, stigma peltate. **Fruit** a fleshy berry with ± 6 seeds. **Seeds** obovoid or globose; testa incurved, crustaceous; endosperm thin; embryo incurved, cotyledons ovate.

Genus 1, species 1, polymorphic, E trop. Africa, Madagascar, Maseareignes, sthn trop. Afr.

Bredenkamp, C.L. in Leistner: 305 (2000), under Flacourtiaceae.

Takhtajan: 203 (1997); Chase *et al.*: 174 (2002). See under Flacourtiaceae (in broad sense) for a discussion of the separation of this family from Flacourtiaceae.

Aphloia (DC.) Benn.

Bennett: 192 (1840); Wild: 279 (1960); White: 265 (1962), Wild & Vidigal: 19 (1973); Sleumer: 55 (1975); Killick: 80 (1976); White *et al.*: 266 (2001); Coates Palgrave: 760 (2002); Bingham (Unpublished); Mapaura (Unpublished).

Description as for family.

Monotypic family: *Aphloia theiformis* (Vahl) Benn., sthn trop. Afr.: Zambia; Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Apiaceae
(Umbelliferae)
(Asteridae—Asterales)
(Euasterids II—Apiales)

Van Wyk, B.-E. in Leistner: 62 (2000).

Sthn trop. Afr.: genera 25, species 60.

Key to genera

1a Fruit (and to some extent the ovary) with silky to bristly or vescicular hairs, or straight to variously hooked spines:
2a Fruit with papillae, tubercles or vescicular hairs:
3a Flowers in dense heads surrounded by an involucre of partly fused stiff bracts; upper leaves with bristles around the margin ..... **Alepidea**
3b Flowers distinctly in umbels, if subcapitate then without an involucre of stiff, partly fused bracts:
4a Rigid, broom-like undershrubs with few to scale-like stem leaves ..... **Deverra**
4b Leafy annual to perennial herbs with leaves often mainly basal:
5a Bracts and bracteoles below the umbels conspicuous ..... **Physotrichia**
5b Bracts and bracteoles below the umbels absent ..... **Pimpinella**
2b Fruit with silky to bristly hairs or straight to variously hooked spines:
6a Leaves simple or palmately lobed to palmately compound:
7a Bracts and bracteoles below the umbels present; fruit with long, hooked spines ..... **Sanicula**
7b Bracts and bracteoles below the umbels absent; fruit with silky to bristly hairs ..... **Pimpinella**
6b Leaves pinnate, pinnately lobed or several times divided, sometimes basal leaves simple:
8a Fruit with silky to bristly hairs:
9a Leaves with strongly developed sheathing base; bracts and bracteoles conspicuous ..... **Diplolophium**
9b Leaves without prominent sheathing base; bracts and bracteoles absent ..... **Pimpinella**
8b Fruit with spines usually tipped with hooked hairs:
10a Spines arranged in distinct rows on the secondary ribs:
11a Involucral bracts entire ..... **Agrocharis**
11b Involucral bracts pinnatisect ..... ***Daucus**
10b Spines not in distinct rows:
12a Ultimate leaf segment triangular-ovate ..... **Torilis**
12b Ultimate leaf segment linear ..... **Angoseseli**
1b Fruit and ovary glabrous:
13a Trees, shrubs or subshrubs with substantial woody caudex; leaves simple, ternate or 1-pinnate:
14a Leaves/leaflets entire; one mericarp with one (the central) dorsal rib winged and the other with two (the intermediate) dorsal ribs winged ..... **Heteromorpha**
14b Leaflets distinctly toothed, the teeth terminating in fine bristly points; fruit with both mericarps similarly winged ..... **Steganotaenia**
13b Annual, biennial or perennial herbs:
15a Flowers in dense heads surrounded by an involucre of partly fused stiff bracts; upper leaves with bristles around the margin ..... **Alepidea**
15b Flowers distinctly in umbels, if subcapitate then without an involucre of stiff, partly fused bracts:
16a Mericarps strongly dorsoventrally compressed (measured without wings twice as wide as thick or wider):
17a Leaves 1-pinnate with 3–7 pairs of roundish to ± ovate, irregularly incised-toothed leaflets ..... **Heracleum**
17b Leaves mostly 2- or more pinnate or -pinnatisect, or 2-ternate, rarely simple:
18a Peduncles very slender ..... **Lefebvrea**
18b Peduncles relatively stout and stiff:
19a Annual herbs; leaves compound-pinnate with filiform ultimate segments; petals bright yellow ..... ***Anethum**
19b Perennial, rarely biennial or annual herbs; leaves, if compound-pinnate, with broader ultimate segments; petals white, cream or greenish yellow or purplish:
20a Mericarps without wings on the dorsal ribs; petals white, cream or greenish yellow ..... **Peucedanum**
20b Mericarps with wings on the 3 dorsal ribs; petals purplish ..... **Pseudoselinum**
16b Mericarps not strongly dorsoventrally compressed, less than twice as broad as thick:
21a Leaves 1-pinnate:
22a Leaflets usually in more than 18 pairs, somewhat coriaceous, overlapping when young ..... **Afrocarum**
22b Leaflets in usually fewer than 16 pairs, not leathery, not overlapping when young:
23a Leaflets regularly neatly denticulate, each tooth with a cartilaginous white mucro incurved over the base of the next tooth ..... **Sium**
23b Leaflets irregularly dentate; mucro on teeth not incurved over the next tooth ..... **Berula**
21b Leaves mostly 2- or more pinnate, or 2-ternate, rarely simple:
24a Leaves strongly resembling leaves of *Ceratophyllum*: broadly linear to strap-shaped in outline, 3-pinnate with very finely divided ultimate segments ..... **Frommia**
24b Leaves broader in outline and often finely divided:

25a Calyx teeth obvious, even in fruit ..... ***Coriandrum**
25b Calyx teeth obscure or obsolete in fruit:
26a Bracts and bracteoles well-developed:
27a Ultimate leaf segments linear, entire ..... **Aframmi**
27b Ultimate leaf segments broader than linear, variously cut or toothed ..... **Conium**
26b Bracts and bracteoles absent:
28a Many umbels are ± sessile ..... **Apium**
28b All umbels pedunculate:
29a Glabrous, glaucous herbs with strong aniseed odour; leaves continually dissected into fine, very slender segments. .... ***Foeniculum**
29b Herbs of varying habit and colour, often at least shortly sparsely hairy, with aniseed odour; leaves various but not dissected in very slender segments throughout ..... **Pimpinella**

Aframmi C.Norman

Norman: 199 (1929); Cannon: 352 (1970); Cannon: 585 (1978); Martins: 63 (1994) as *Aframi*; Bingham & Smith: 140 (2002).

Biennial or perennial herbs. **Leaves** finely divided. **Flowers** in terminal and lateral umbels with long wiry rays; bracts and bracteoles well-developed; bracts entire or slightly pinnatifid, probably frequently semicaducous. **Calyx**: teeth broadly triangular. **Petals** with inflexed apex, yellowish green. **Disc** with undulate margin. **Styles** short, divergent; stigmatic surfaces slightly clubbed; stylopodium low-conical. **Fruit** ovate to obovate, slightly laterally compressed; ribs well-developed, obtuse; vittae large, 1 in each interval and 2 in commissural surface.

Species 2, Zaire, and sthn trop. Afr. 2, Angola, Zambia.

Afrocarum Rauschert

Rauschert: 555 (1982); Townsend: 69 (1989).

Baumiella H.Wolff; Cannon: 343 (1970); Cannon: 595 (1978); Cannon & Martins: 37 (1981).

Perennial herbs. **Leaves** imbricated when young and bearing spinous cartilaginous teeth. **Flowers** in compound umbels; bracts and bracteoles many and well-developed. **Calyx**: teeth obsolete. **Petals** suborbicular to broadly obcordate, apex emarginated with an inflexed point. **Style** short, stiff, erect, slightly divergent; stigmatic surfaces slightly thickened; stylopodium well-developed, conical with a thickened, undulate margin. **Fruit** ovoid, slightly laterally compressed; ribs filiform but quite distinct. **Fruit**: mericarps pentagonal in section; commissural face flat; vittae 1 in each interval and 2 in commissural face. **Seed** with flat commissural face.

Monotypic genus: *Afrocarum imbricatum* (Schinz) Rauschert, centered in sthn trop. Afr., Angola, Zambia, Zimbabwe, Malawi, Mozambique; but also in Zaire and S Tanzania.

Agrocharis Hochst.

Cannon: 572 (1978); Cannon & Martins: 19 (1981); Townsend: 30 (1989).

Sthn trop. Afr. 2, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Alepidea F.Delaroche

Cannon: 567 (1978); Cannon & Martins: 12 (1981); Townsend: 19 (1989); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Anethum** L.

Linnaeus: 263 (1953); Cannon: 353 (1970); Cannon: 607 (1978); Cannon & Martins: 46 (1981); Townsend: 87 (1989).

Robust, rather glabrous annual herbs, with a strong characteristic odour; stem terete, with many fine grooves. **Leaves** 3- or 4-pinnate, ultimate segments narrowly linear to filiform. **Flowers** in terminal, compound umbels, equalled or exceeded by long-peduncled laterals; rays many, up to 40 mm long; bracts and bracteoles 0; partial umbels with up to 35 flowers, but those of small plants may have as few as 6. **Sepals** obsolete. **Petals** yellow with an obvious inturned apex. **Fruit** elliptic, strongly dorsiventrally compressed, with a moderately well-developed marginal wing paler in colour than body of fruit; stylopod low-conical; styles short, clubbed at apex, divergent and shed before fruit matures; dorsal ribs filiform; carpophore 2-cleft to base; vittae well-developed, 1 per interval and 2 in commissural face.

Monotypic genus: **Anethum graveolens* L., the culinary herb Dill, locally escaped from cultivation in Mozambique.

Angoseseli Chiov.

Chiovenda: 38 (1924); Cannon: 344 (1970).

Caucalis in the sense of Hiern: 432 (1898).

Annual herbs dichotomously branched from base. **Leaves** pinnatisect with ultimate segments linear. **Flowers** in leaf-opposed and terminal umbels; bracts and bracteoles narrowly linear. **Calyx**: lobes obsolete or concealed by whitish hairs of densely setose ovary. **Petals** incurved at apex, broadly obovate. **Stamens** exserted; anthers violet. **Fruit** ovoid, laterally compressed; carpels almost terete; ribs not prominent, densely setose with irregularly arranged whitish prickles; vittae all solitary; stylopod conical, ± free from axis of bipartite carpophore; styles divaricate to nearly deflexed. **Seeds** somewhat dorsally compressed, broadly furrowed or almost hollowed on commissural face.

Monotypic genus: *Angoseseli mossamedensis* (Welw. ex Hiern) Norman, Angola.

Apium L.

Cannon: 343 (1970); Cannon: 582 (1978); Cannon & Martins: 29 (1981).

Sthn trop. Afr. 2, widespread weeds, probably introduced in Angola, Zambia, Zimbabwe, Mozambique; 1 species indigenous in sthn Afr.

Berula W.D.J.Koch

Cannon: 349 (1970); Cannon: 598 (1978); Townsend: 71 (1989).

Monotypic genus: *Berula erecta* (Huds.) Coville, cosmopolitan weed recorded in sthn trop. Afr. from Angola and Zimbabwe, and from sthn Afr.

Conium L.

Cannon: 578 (1978); Cannon & Martins: 24 (1981).

Sthn trop Afr. 1: *Conium maculatum* L., Hemlock, highly poisonous, cosmopolitan weed recorded from Zimbabwe, and Mozambique, and from sthn Afr.

***Coriandrum** L.

Cannon: 340 (1970); Cannon: 575 (1978); Cannon & Martins: 23 (1981).

Sthn trop. Afr. 1: **Coriandrum sativum* L., Coriander, escape from cultivation in Angola, Zimbabwe, Mozambique, and sthn Afr.

***Daucus** L.

Cannon: 360 (1970).

Sthn trop. Afr. 1: **D. carota* L., Carrot, occasional escape from cultivation.

Deverra DC.

Cannon: 585 (1978); Pfisterer & Podlech: 571 (1986).

Pituranthos Viv., illegitimate name.

Sthn trop. Afr. 1: *Deverra burchellii* (DC.) Eckl. & Zeyh., Zimbabwe, and sthn Afr.

Diplolophium Turcz.

Cannon: 350 (1970); Cannon: 600 (1978); Cannon & Martins: 40 (1981); Townsend: 80 (1989).

Physotrichia Hiern, in part.

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Foeniculum** Mill.

Cannon: 353 (1970); Cannon: 605 (1978); Cannon & Martins: 44 (1981).

Sthn trop. Afr. 1: **Foeniculum vulgare* Mill., Fennel; cultivated and a weed, recorded from Angola, Zimbabwe, Mozambique, and sthn Afr.

Frommia H.Wolff

Wolff: 266 (1912); Cannon: 587 (1978); Townsend: 48 (1989); Bingham & Smith: 140 (2002).

Perennial herbs with a robust woody rootstock; base of stem with persistent fibrous remains of old leaf bases; stem terete, hollow, with fine striations. **Leaves** 3-pinnate, *Ceratophyllum*-like, with very finely divided ultimate segments, mostly grouped near base of stem. **Flowers** in compound umbels with ± 7 fine rays; bracts and bracteoles 0. **Calyx**: teeth obsolete. **Petals** with strongly inflexed apices. **Fruit** pyriform when mature; stylopodium low-conical; styles short, blunt and deflexed; mericarps slightly dorsally compressed, ribs only slightly developed; vittae prominent in mature fruit: 3 in each furrow and ± 6 on commissural face; carpophore slightly 2-fid at apex. **Seed**: endosperm somewhat curved on inner face.

Monotypic genus: *Frommia ceratophylloides* H.Wolff, S Tanzania and adjoining parts of Zambia and Malawi.

Heracleum L.

Linnaeus: 249 (1753); Cannon: 619 (1978); Townsend: 120 (1989).

Perennial or biennial herbs, with fleshy to woody taproots; stem terete, solid, rather coarsely striate with clearly marked ridges. **Leaves** pinnately divided, usually with 3–7 pairs of broad segments and 1 terminal one, petiole sheathing at base. **Flowers** in compound umbels; rays 7–14, subequal; bracts 0; bracteoles several. **Calyx**: teeth minute or obsolete, unequal. **Petals** white (sometimes flushed with pink, especially in bud), often markedly unequal and radiate, those on outer margin of umbel much larger than those on inside, whole umbel therefore tending to function like a capitulum in attracting insects, although individual flowers remain quite distinct. **Fruit** orbicular to broadly obovate, very strongly dorsally compressed, with a broad commissure; marginal ridges expanded to form a broad wing, dorsal ones filiform; wings somewhat thickened and closely appressed to those of opposing mericarp; vittae solitary in intervals, clearly visible from exterior, and tending to be club-shaped, narrowing towards base, with 2 on commissural face.

Species 65, N temperate and tropical mountains; sthn trop. Afr. 1: *Heracleum abyssinicum* (Boiss.) Norman, reaching its southern limit on the Nyika Plateau, Malawi.

Heteromorpha Cham. & Schltdl.

Norman: 236 (1933); Cannon: 340 (1970); Cannon: 232 (1968); Cannon: 578 (1978); Cannon & Martins: 26 (1981); Townsend: 843 (1985b); Townsend: 37 (1989); Winter & Van Wyk: 225 (1996); White *et al.*: 577 (2001); Coates Palgrave: 853 (2002).

Annesorhiza Cham. & Schltdl.; Norman: 200 (1929). *Bupleurum* in sense of Norman: 234 (1933).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lefebvrea A.Rich.

Richard: 260 (1840); Norman: 201 (1929) as *Lefeburia*; Cannon: 358 (1970); Cannon: 614 (1978); Cannon & Martins: 54 (1981); Townsend: 109 (1989).

Robust, glabrous biennial or perennial herbs; stems terete, finely and regularly grooved. **Leaves** 2-ternate or 2-pinnate (often rather irregularly so); leaflets linear to lanceolate. **Flowers** in terminal and lateral compound umbels with 10–30 rays; bracts 0–few; bracteoles few to several but probably caducous. **Calyx**: teeth minute or 0. **Petals** pale yellow to greenish white, with inturned apices. **Fruit** broadly elliptic to pyriform, very strongly dorsiventrally compressed with a broad commissure; lateral wings very well-developed and surrounding stylopodium at apex; dorsal ribs filiform, stylopodium well-developed, conical to elongate-conical; vittae large and conspicuous, 1 per interval and 2 on commissural face; carpophore divided to base.

Species 6, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique,?and sthn Afr. A rather poorly defined generic group of

5–10 species widely distributed in trop. Africa. Its relationship to *Peucedanum* is in grave need of clarification.

Peucedanum L.

Cannon: 354 (1970); Cannon: 609 (1978); Cannon & Martins: 48 (1981); Townsend: 587 (1987); Townsend: 89 (1989).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Physotrichia Hiern

Hiern: 161 (1873); Cannon: 351 (1970); Cannon: 603 (1978); Townsend: 83 (1989).

Spuriodaucus C.Norman, at least as to *S. atropurpurens* C.Norman: 234 (1933); Cannon: 352 (1970).

Robust biennial or perennial herbs; rootstock woody. **Leaves** mostly basal with nearly bare stems, mostly simple with 3–5 subpalmate lobes. **Flowers** in terminal and lateral compound umbels; bracts and bracteoles present. **Sepals** well-developed, narrowly triangular to subulate, sometimes persisting on mature fruit. **Petals** obovate, apex incurved, white, cream or purple. **Fruit** elliptic to ovoid, slightly dorsiventrally compressed, covered with vescicular hairs especially on ribs; stylopodium conical; styles short and ± divergent; ribs obtuse; vittae well-developed, 1 in each interval and 2 in commissural face; carpophore divided to base; seed concave on commissural face.

Species 10, trop. Africa; sthn tropical Afr. 4, Angola, Zambia, Malawi.

Pimpinella L.

Norman: 199 (1929); Cannon: 345 (1970); Cannon: 589 (1978); Cannon & Martins: 32 (1981); Townsend: 759 (1985a).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pseudoselinum C.Norman

Norman: 201 (1929); Cannon: 354 (1970).

Selinum in sense of Norman: 119 (1922).

Glabrous perennial herbs. **Leaves** radical, bipinnatisect. **Flowers** in large, many-rayed umbels with very long thick rays and many involucral bracts. **Flowers** bisexual and unisexual with male flowers in centre of umbels. **Calyx** with obsolete or minute lobes. **Petals** lanceolate, acuminate, with inflexed apex, purplish. **Disc** with undulate margin. **Styles** short; stylopodium small. **Fruit** oval, truncate at base, mericarps strongly dorsoventrally compressed, with 5 broad, rigid wings: 2 lateral ones and 3 slightly narrower ones on the primary dorsal ribs; oil ducts solitary between ribs, large; carpophore bipartite. **Seeds** compressed.

Monotypic genus: *Pseudoselinum angolense* (C.Norman) C.Norman, known only from Angola.

Sanicula L.

Cannon: 565 (1978); Cannon & Martins: 9 (1981); Townsend: 17 (1989).

Sthn trop. Afr. 1: *Sanicula elata* D.Don, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sium L.

Cannon: 350 (1970); Cannon: 598 (1978); Cannon & Martins: 39 (1981).

Sthn trop. Afr. 1: *Sium repandum* Welw. ex Hiern, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Steganotaenia Hochst.

Cannon: 358 (1970); Cannon: 616 (1978); Cannon & Martins: 56 (1981); Townsend: 115 (1989); Coates Palgrave: 852 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Torilis Adans.

Cannon: 340 (1970); Cannon: 570 (1978); Cannon & Martins: 17 (1981); Townsend: 26 (1989).

Sthn trop. Afr. 1: *Torilis arvensis* (Huds.) Link, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Apocynaceae (in broad sense)
(Asteridae—Gentianales)
(Euasterids I—Gentianales)

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The classification of the Apocynaceae reflected here and the keys to subfamilies and tribes are based on Endress & Bruyns (2000). See also Endress (2001) and Omino (2002). The keys to genera are adapted from Leeuwenberg (2001), Omino (1996) and Victor *et al.* (2000). The key to genera of the Asclepiadeae is very tentative as the group still requires much further study (Meve 2002).

Sthn trop. Afr.: genera 85, species ± 407.

Key to the subfamilies of the Apocynaceae (in broad sense)

1a Anthers free from the style head; aestivation of corolla lobes in bud typically sinistrorse (overlapping to the left), rarely dextrorse; fruit dehiscent or indehiscent, syncarpous or apocarpous, a berry, drupe, follicle, or capsule; seeds naked, with wings, or arils, but almost never with a coma (tuft of hairs) at one end ..... **Rauvolfioideae** (Plumerioideae) [below]

1b Anthers adnate or ± adherent to the style head; aestivation of corolla lobes in bud dextrorse (overlapping to the right) or valvate, rarely sinistrorse; fruit dehiscent, almost always apocarpous, a pair of follicles, sometimes reduced to one by abortion or postgenitally fused; seeds small, compressed, almost always with a coma at one end:

2a Anthers 4-locular, adherent to style head by hairs or secretions, lower part often sterile; filaments free; pollen almost always shed as monads; style head secretions for pollen transport normally a foamy adhesive or gummy, undifferentiated translators; nectaries, if present, in a ring around the base of the ovary ..... **Apocynoideae** [p. 61]

2b Anthers 2- or 4-locular, adnate to style head, fertile throughout; filaments free or fused; pollen shed as tetrads or gathered in pollinia; style head secretions for pollen transport forming differentiated translators with a sticky end (viscidium) or pollinaria consisting of 2(4) pollinia attached by flexible arms (caudicles) to a sticky clip (corpuscle); nectaries located in alternistaminal troughs at base of filaments or staminal column:

3a Pollen shed in tetrads into spoon-shaped translators with a sticky end which can adhere to a pollinator for removal; anthers 4-locular ..... **Periplocoideae** [p. 63]

3b Pollen gathered in pollinia attached in pairs (or 4s) to a ± spherical corpuscle which can become attached to a pollinator for removal; anthers 2- or 4-locular:

4a Anthers 4-locular; pollen gathered in 4 very small pollinia attached to a soft, pale corpuscle ..... **Secamonoideae** [p. 63]

4b Anthers 2-locular; pollen gathered in 2 pollinia attached to a dark hard corpuscle ..... **Asclepiadoideae** [p. 63]

Subfamily **Rauvolfioideae** (Plumerioideae)

Sthn trop. Afr.: genera 24, species 72.

Key to tribes of Rauvolfioideae (only for sthn trop. Afr.)

1a Anthers usually sagittate at the base and with lignified gynostegial grooves (guide rails); fruit fleshy, either a pair of dehiscent follicles with arillate seeds or an indehiscent berry ..... **Tabernaemontaneae**
(Genera 7, species 16: *Callichilia*, *Carvalhoa*, *Crioceras*, *Schizozygia*, *Tabernaemontana*, *Tabernanthe*, *Voacanga*)

1b Anthers rarely sagittate at the base, without lignified gynostegial grooves; fruit fleshy or dry, berries, drupes, follicles, or capsules; arils absent:

2a Fruit indehiscent, a berry; leaves almost always opposite:

3a Ovary consisting of 2–5 separate carpels; pericarp mostly fibrous ..... **Hunterieae**
(Genera 3, species 5: *Hunteria*, *Picralima*, *Pleiocarpa*)

3b Ovary consisting of 2 partly fused carpels; pericarp not fibrous:

4a Placentas becoming lignified in fruit, forming a thin woody partition; spines are often present in leaf axils; indole alkaloids absent ..... **Carisseae**
(Genera 2, species 8: *Acokanthera*, *Carissa*)

4b Placentas not lignified in fruit; without spines in leaf axils; indole alkaloids present:

5a Corolline corona scarcely discernable; shrubs or small trees ..... **Melodineae**
(Genus 1, species 1: *Diplorhynchus*)

5b Corolline corona absent; trees, shrubs, or lianes (the latter often with tendrils) ..... **Willughbeieae**
(Genera 8, species 34: *Ancylobotrys*, *Chamaeclitandra*, *Clitandra*, *Cylindropsis*, *Dictyophleba*, *Landolphia*, *Saba*, *Vahadenia*)

2b Fruit either indehiscent or dehiscent, but not a berry; leaves opposite, alternate or whorled:

6a Seeds without wings or hairs, sometimes with flattened edge, but without well-developed wing(s) or hairs on margin; fruit indehiscent and drupaceous or a pair of dehiscent follicles; style head mostly with basal collar; disc mostly present; herbs, shrubs or trees ..... **Vinceae**
(Genera 2, species 6: *Catharanthus*, *Rauvolfia*)

6b Seeds mostly with well-developed (often membranous) wing(s)or hairs on margin; fruit usually a pair of dehiscent follicles; style head with or without a basal collar; disc mostly absent or adnate; trees, shrubs or lianas:

7a Corolline corona absent; anthers without apical or basal extensions; leaves whorled, sometimes opposite ..... **Alstonieae**
(Genus 1, species 2: *Alstonia*)

7b Corolline corona often present as small lobes in throat or ridges behind anthers; anthers sometimes with short, sterile appendages; leaves opposite; plants of the Old World ..... **Melodineae**
(Genus 1, species 1: *Diplorhynchus*)

For key to genera of Rauvolfioideae see under Apocynoideae (below).

Subfamily **Apocynoideae**

Sthn trop. Afr.: genera 12, species 57.

Key to tribes of Apocynoideae (only for sthn trop. Afr.)

1a Style head spool-shaped, slender in the middle, greatest in diameter at the base; a membranous collar is usually present at the base; a disc is absent or present ..... **Wrightieae**
(Genera 4, species 24: *Adenium*, *Pleiocerας*, *Strophanthus*, *Wrightia*)

1b Style head globose with slender, elongate, conical apex or broadly ovoid to broadly fusiform, broadest at about the middle and tapering at both ends, or style head cylindric with 5 vertical ribs; a membranous collar is absent at the base; a disc is almost always present:

2a Style head globose with slender, elongate, conical apex, ± round in cross section; anthers attached (sometimes only very weakly so) at about the middle of the style head; thecae are free; a chalazal zone is often present; mostly trees, sometimes lianas ..... **Malouetieae**
(Genera 5, species 15: *Alafia*, *Funtumia*, *Holarrhena, Mascarenhasia*, *Pachypodium*)

2b Style head broadly ovoid to very broadly fusiform; stamens generally arising near the base of the corolla; anthers attached to the style head by a slender tuft of hairs with a broader sweeping brush of hairs below this; ovary often semi-inferior ..... **Apocyneae**
(Genera 3, species 18: *Baissea*, *Motandra*, *Oncinotis*)

Key to genera of Apocynoideae and Rauvolfioideae (Plumerioideae)

[adapted from Leeuwenberg (2001) and Omino (1996)]

1a Leaves alternate:

2a Plants spiny and succulent ..... **Pachypodium**

2b Plants not spiny, succulent; corolla ampie, pink ..... **Adenium**

1b Leaves opposite or whorled:

3a Leaves whorled:

4a Ovary composed of 2–5 separate carpels ..... **Pleiocarpa**

4b Ovary composed of 2 partly fused carpels:

5a Leaves dull glaucous beneath, with many dense straight secondary veins; large trees; fruits long, slender, dry follicles; seeds with hairs chiefly at both ends ..... **Alstonia**

5b Leaves green beneath; secondary veins not dense, usually curved; small trees or shrubs ..... **Rauvolfia**

3b Leaves opposite, sometimes subopposite:

6a Ovary composed of 2–5 separate carpels; pericarp often fibrous:

7a Sepals completely glabrous on both sides; style head subglobose to oblong; inflorescence sessile, predominantly axillary and on old wood; bracts shorter than 0.4 mm ..... **Pleiocarpa**

7b Sepals glabrous outside, with colleters inside; style head with a stigmatic oblong to subglobose basal part and a stigmoid apex up to 1.5 mm long; inflorescence predominantly terminal and sometimes axillary; bracts at least 0.5 mm long:

8a Sepals imbricate even at anthesis, (3.5–)5.5–7.5 mm long, with colleters covering up to $^1/_5$ of their length; testa coriaceous; cotyledons with secondary nerves; fruits 110–200 x 80–150 mm, wall very hard and very fibrous ..... **Picralima**

8b Sepals imbricate in bud, 7–25 mm long, with colleters covering up to almost half of their length; testa membranaceous; cotyledons without visible secondary nerves; fruits 20–50 x10–50 mm, wall mostly fleshy ..... **Hunteria**

6b Ovary composed of 2 partly fused carpels; pericarp not fibrous:

9a Spiny shrubs, climbers or sometimes trees; corolla white or pink; fruit a red to black berry ..... **Carissa**

9b Spineless plants; corolla variously coloured; fruit baccaceous or capsular:

10a Herbs or undershrubs; corolla with a narrow almost cylindric tube and a wide flat limb, white and/or pink ..... ***Catharanthus roseus**

10b Plants woody; corolla various:

11a Corolla lobes overlapping to the left:

12a Carpels completely fused:

13a Trees or shrubs:

14a Repeatedly dichotomously branched shrub with clearly pedunculate inflorescences in the forks; corolla pale yellow with red, purple or violet stripes or dots; fruits orange, often bumpy, 29–64 mm long, resembling mandarins or limes ..... **Tabernanthe iboga**

14b Usually differently branched trees or shrubs; with terminal and/or axillary fasciculate inflorescences; corolla white or sometimes pink, without stripes or dots; fruit red to almost black, smooth, up to 32 mm long, subglobose or ellipsoid:

15a Ramification not furcate; inflorescence axillary; anthers with stiff hairs; sap extremely poisonous ..... **Acokanthera**

15b Ramification usually furcate; inflorescence terminal and sometimes also axillary; anthers glabrous; sap not poisonous ..... **Carissa**

13b Climbers or (see couplet 22a) rhizomatous shrubs:

16a Corolla tube 25–100 mm long, if 10–17 mm long then lobes falcate; fruits fleshy, apocarpous, thick follicles ..... **Tabernaemontana**

16b Corolla tube up to 22 mm long; lobes not falcate:

17a Calyx with many colleters inside; leaves with 5–10 pairs of distant secondary veins; flowers conspicuous .. **Vahadenia**

17b Calyx without colleters, rarely with 5–15 colleters inside in groups of 1–3 alternating with the sepals:

18a Inflorescences of elongate, branched terminal panicles:

19a Anthers keeled along the back; ovary and fruit pubescent; stipules absent ..... **Ancylobotrys**

19b Anthers not keeled; ovary glabrous and fruit usually glabrous; stipules interpetiolar, early caducous ..... **Dictyophleba**

18b Inflorescences contracted, short and often clustered, terminal or axillary, rarely some inflorescences elongate:

20a Anthers ± $^1/_2$–$^3/_4$ as long as the corolla tube; corolla lobes often longer than the tube ..... **Landolphia**

20b Anthers up to $^1/_3$ as long as the corolla tube, frequently less:

21a Wall of the corolla tube thickened above the anthers; anthers not keeled:

22a Rhizomatous shrubs with straight stems; corolla tube 9–13 mm long; stamens arising in the lower quarter of the corolla tube ..... **Chamaeclitandra**

22b Climber with curled tendrils, if a rhizomatous shrub, then stamens arising in the upper half of the corolla tube (*Landolphia gossweileri, L. lanceolata* and *L. thollonii*) ..... **Landolphia**

21b Wall of the corolla tube not thickened above the anthers; anthers keeled or not (see also *Landolphia nitidula* and *L. robustior*):

23a Only terminal inflorescence developed ..... **Saba**

23b Inflorescence axillary or axillary and at the same time terminal:

24a Endosperm copious, 20 mm thick; cotyledons 0.2 mm thick; pistil 0.7–1.3 mm long, with head never reaching the stamens; corolla tube 3.2–6.5 mm long ..... **Clitandra**

24b Endosperm thin, thinner than 1 mm; cotyledons 2–3 mm thick; pistil 1.7–4.7 mm long, with head reaching the anthers; corolla tube 2.2–4.3 mm long ..... **Cylindropsis**

12b Carpels nearly free:

25a Corolla with a corona:

26a Corona lobes branched, ± as long as the corolla lobes ..... **Pleioceras**

26b Corona lobes unbranched, much shorter than the corolla lobes ..... **Wrightia**

25b Corolla without corona:

27a Petiole ± $^1/_3$ as long as the blade; fruit composed of 2 dry follicles; seeds winged ..... **Diplorhynchus**

27b Petiole less than $^1/_4$ as long as the blade; fruit composed of 2 fleshy or less often dry follicles; seeds not winged:

28a Bracts large, 40–110 x 25–70 mm, completely covering the sepals; inflorescence 1- or 2-flowered with large pendulous flowers; Gabon to Angola ..... **Crioceras**

28b Bracts shorter to slightly longer than the sepals, never covering them:

29a Pistil head coherent with the anthers and therefore style and pistil head shed with the corolla; calyx also shed along with the corolla or some time later, at least before the fruit matures; in the latter case the corolla tube up to 1.4 times as long as the calyx (exceptions to this last character: *V. chalotiana*) ..... **Voacanga**

29b Pistil head not coherent with the anthers and therefore pistil still complete after the corolla has been shed; calyx persistent even in fruit; corolla tube probably never less than twice as long as the calyx:

30a Corolla lobes inflexed in bud and therefore seemingly much shorter in bud than in open flowers ..... **Tabernaemontana**

30b Corolla lobes not inflexed in bud and therefore not or only slightly shorter in bud than in open flowers:

31a Corolla large, tube (13–)20–110 mm long, lobes with 2 apices, one rounded and one acute; sepals mostly longer than 5 mm ..... **Callichilia**

31b Corolla much smaller, tube (3–)5–10 mm long, lobes with a single rounded or obtuse apex; sepals up to 4 mm long:

32a Corolla tube campanulate, not contracted at the mouth, 8–10 mm long, lobes in bud not forming a head; mericarps smooth ..... **Carvalhoa**

32b Corolla tube almost cylindric, contracted at the mouth, widest just above the base and therefore often wider than the ovoid apical head when in bud, (3–)5–8.7 mm long; mericarps fused and smooth or lumpy and separate and with soft blunt prickles ..... **Tabernanthe**

11b Corolla lobes overlapping to the right:

33a Trees or shrubs; corolla lobes not caudate:

34a Repeatedly dichotomously branched shrubs; inflorescences in the forks ..... **Schizozygia**

34b Shrubs or trees, not repeatedly dichotomously branched; inflorescences terminal and/or axillary:
35a Leaves with domatia, often consisting of pits ... **Funtumia**
35b Leaves without domatia (see also *Funtumia africana*):
36a Fruit a drupe with a fleshy mesocarp; peduncle usually longer than 20 mm; corolla slightly irregular ... **Rauvolfia**
36b Fruit a dry follicle; peduncle up to 10 mm long; corolla regular:
37a Corolla lobes conduplicate in bud, ovate, acute or acuminate, tube clearly widened around the stamens; leaves coriaceous ... **Mascarenhasia**
37b Corolla lobes not conduplicate, narrowly obovate, rounded or nearly so, tube cylindric, not widened around the stamens; leaves herbaceous, papery when dry ... **Holarrhena**
33b Climbers, if shrubs then corolla caudate:
38a Corolla with paired corona appendages between the (frequently long-tailed) corolla lobes; when corolla lobes not long-tailed then tube 24–45 mm long ... **Strophanthus**
38b Corolla with non-paired corona lobes or without corona; tube shorter than 10 mm; if corolla tube up to 21 mm long then stamens exserted:
39a Supra-axillary glands absent on the petiole; corolla limb usually spreading or recurved ... **Alafia**
39b Supra-axillary glands present on the petiole; corolla limb often suberect:
40a Inflorescence terminal; follicles widest near the base, with a deciduous brown tomentum ... **Motandra**
40b Inflorescence axillary and often at the same time terminal; follicles widest near the middle or cylindric:
41a Anther tails straight, acute; corolla lobes 0.6–2.9 mm long, often suberect or halfway recurved; follicles narrowly cylindric, up to 0.5(–1) m long, mostly up to 10 mm in diameter ... **Baissea**
41b Anther tails curved, obtuse; corolla lobes 1.7–7.3 mm long, usually spreading; follicles from less than 10 mm to 60 mm wide ... **Oncinotis**

Subfamily **Periplocoideae**

Sthn trop. Afr.: genera 8, species 35.

Key to genera of Periplocoideae

1a Gynostegium enclosed and concealed within the corolla tube:
2a Corona lobes arising in the mouth of the corolla tube ... **Stomatostemma**
2b Corona lobes arising lower down in the corolla tube, mostly around the middle of the tube ... **Cryptolepis**
1b Gynostegium exserted from the mouth of the corolla:
3a Corolla tube well defined, broadly campanulate to cylindric; stamens arising at or near the mouth of the corolla tube ... **Raphionacme**
3b Corolla rotate, lobed almost to the base; stamens arising ± from the base of the corolla:
4a Corona small, annular, shortly 5-lobed; translators rhombic, deeply cleft ... **Batesanthus**
4b Corona relatively large; translators spathulate:
5a Corona lobes broadly obcordate, usually with a linear dorsal appendage ... **Mondia**
5b Corona lobes ± filiform to linear, simple or divided:
6a Stamens hairy ... **Periploca**
6b Stamens glabrous:
7a Corolla lobes linear to very narrowly ovate or obovate; corona double: outer one fused into a basal ring with 5 linear segments often bifid at apex; inner one of 5 free filiform segments; pollen in pollinia ... **Schlechterella**
7b Corolla lobes broadly ovate to oblong-ovate; corona simple, of filiform to narrowly ovate segments; pollen in tetrads ... **Tacazzea**

Subfamily **Secamonoideae**

Sthn trop. Afr.: genus 1, species 11.

Only genus in sthn trop. Afr. ... **Secamone**

Subfamily **Asclepiadoideae**

Sthn trop. Afr.: genera 40, species 232.

Key to tribes of Asclepiadoideae (only for sthn trop. Afr.)

1a Pollinia pendent ... **Asclepiadeae**
1b Pollinia erect:
2a Pollinia with insertion crest:
3a Insertion crest present on inner or lower edge of pollinium; coronal elements absent beneath gynostegial grooves ... **Marsdenieae**
(Genera 4, species 12: *Cibirhiza*, *Fockea*, *Gougroneua*, *Telosma*)
3b Insertion crest present on upper or outer edge of pollinium; coronal elements present beneath gynostegial grooves ... **Ceropegieae**
(Genera 12, species 110: *Brachystelma*, *Ceropegia*, *Duvalia*, *Hoodia*, *Huernia*, *Neoschumannia*, *Orbea*, *Orthanthera*, *Riocreuxia*, *Sisyranthus*, *Stapelia*, *Tavaresia*)
2b Pollinia without insertion crest:

4a Carpels narrowing gradually into a slender neck below the style head; anther appendages with a basal horizontal slit ..... **Asclepiadeae** (Genera 24, species 110: *Aidomene*, *Asclepias*, *Aspidoglossum*, *Calotropis*, *Cynanchum*, *Enicocarpus*, *Glossostelma*, *Gomphocarpus*, *Kanahia*, *Margaretta*, *Odontostelma*, *Pachycarpus*, *Pentarrhinum*, *Pergularia*, *Periglossum*, *Pleurostelma*, *Sarcostemma*, *Schizostephanus*, *Sphaerocodon*, *Stathmostelma*, *Stenostelma*, *Trachycalymma*, *Tylophora*, *Xysmalobium*)

4b Carpels without a slender neck, style head therefore sessile on carpels; anther appendages without a basal horizontal slit ..... **Marsdenieae** (see above for number of genera and species)

Key to genera of Marsdenieae

1a Pollinia attached directly to the corpuscle (caudicles absent):

2a Corolla rotate; corona with outer lobes basally united into a pentagonal disc adpressed to surface of corolla ..... **Cibirhiza**

2b Corolla with a campanulate to cylindric tube; corona forming a cylindric tube around the gynostegium ..... **Fockea**

1b Pollinia with slender to stout caudicles attaching them to the corpuscle:

3a Corona on staminal column absent; corona on corolla tube present as pubescent ridges with inward directed tips ..... **Gongronema**

3b Corona on staminal tube present; anther appendages elongate, membranous, incumbent on style apex or applied to side of conical tip or beak ..... **Telosma**

Key to genera of Ceropegieae

1a Stems herbaceous to fleshy, erect, prostrate or twining, with well-developed leaves to ± leafless and tuberculate, but tubercles not arranged into angles; flowers not fleshy:

2a Corona present only as a spreading, somewhat arched ridge behind the anthers; style head with slender apex covered by anthers; follicles single by abortion (corolla with a slender tube inflated at the base) ..... **Orthanthera**

2b Corona present as 2 or 3 series with outer series sometimes much reduced to a low ridge between the anthers:

3a Anthers ascending to erect, pressed into the sides of the style head:

4a Corolla tubular, often with an inflated base, 1–3 times as long as the lobes ..... **Riocreuxia**

4b Corolla lobes free ..... **Neoschumanniana**

3b Anthers horizontal and pressed into the top of the style head:

5a Corolla rotate to campanulate, tube broader than long, if longer, then inner corona lobes not exceeding the anthers ..... **Brachystelma**

5b Corolla tube longer than broad; inner corona lobes exceeding the anthers, connivent into a column above the style head (rarely shorter than the anthers) ..... **Ceropegia**

1b Stems fleshy; leaves reduced to small rudiments or absent, leaf rudiments borne on tubercles arranged into 4 or more angles along the stem; flowers fleshy:

6a Outer and inner series of corona lobes vertically well separated on the staminal tube and partly or wholly fused to one another (outer corona often disc-like):

7a Leaf rudiments with small stipular denticles; corona stipitate, outer series resting on the rim or the sides of the cup formed by the annulus ..... **Duvalia**

7b Leaf rudiments without stipular denticles; corona not stipitate, outer series spreading on the base of the tube and often partly fused to it ..... **Huernia**

6b Outer and inner series of corolla lobes not vertically separated on the staminal tube and partly or wholly fused to one another (outer corona never disc-like):

8a Tubercles on stems arranged into 6 or more angles; each tubercle armed with 1 or more spines:

9a Spines 3 per tubercle; flowers deeply tubular; outer corona with long slender lobules, each tipped with a tear-like knob ..... **Tavaresia**

9b Spines 1 per tubercle; flowers rotate to shallowly bowl-shaped; lobes of outer corona short, without an apical knob ..... **Hoodia**

8b Tubercles on stems arranged into 4 or 5(6) angles; tubercles not spiny:

10a Stems, pedicels, sepals and outside of corolla pubescent (stems sometimes ± glabrous); leaves deciduous, erect; flowers often covered inside with fine slender hairs ..... **Stapelia**

10b Stems, pedicels, sepals and outside of corolla glabrous; leaves spreading or absent ..... **Orbea**

Key to genera of Asclepiadeae (a tentative approximation)

1a Corona in 3 series; leaves deeply cut into 5 or 7 narrowly triangular lobes; follicles with 4 spines, strongly resembling fruits of *Emex* .. **Emicocarpus**

1b Corona in 1 or 2 series; leaves entire; follicles not spiny:

2a Corona petal-like, more conspicuous than corolla:

3a Plant with grass-like habit and sessile, narrowly linear leaves; corona lobes ligulate-spathulate, entire, with margins involute at base and with 2 wing-like excrescences inside the margins near the base forming a cup- to basin-like structure ..... **Aidomene**

3b Plant with subsessile, lanceolate to narrowly oblong leaves; corona lobes usually ± oblong-obovate with irregularly shallowly lobed to entire margin, base claw-like with 2 or 3 teeth next to and on the midrib ..... **Margaretta**

2b Corona not petal-like, less conspicuous and usually shorter than the corolla:

4a Corona consisting of a ± uniformly tall outer series of fused lobes encircling the gynostegium, often with an inner series of 5 lobes adpressed to the backs of the anthers:

5a Stem succulent climbers or shrubs with ± leafless, rod-like stems; outer coronal series ± cupular near base of gynostegium, much shorter than and separated from the inflated vesicular inner lobes adpressed to the backs of the anthers ..... **Sarcostemma**

5b Leafy geophytes; stems succulent or not; outer coronal series cupular to tubular, sometimes divided nearly to the base, but equalling or exceeding and obscuring the gynostegium, and fused to the inner lobes if these are present ..... **Cynanchum** and **Schizostephanus**

4b Corona consisting of very small lobes beneath the gynostegial grooves (guide rails) (sometimes absent), often accompanied by much larger

lobes behind the anthers; anthers often with adaxial outgrowths or keels spreading towards the style head:

6a Stem twining:

7a Corolla with microscopic hairs inside, lobes divided ± to the base; the corona is absent beneath the gynostegial grooves, the lobes behind the anthers with incurved margins; pollinia are attached by slender caudicles, without an insertion crest ..... **Pentarrhinum**

7b Corolla with long hairs towards edges of lobes or at least towards base on inside:

8a Milky latex present; corolla with conspicuous hairs towards the edges of the lobes; corona with 5 discrete lobes beneath the gynostegial grooves ..... **Pergularia**

8b Colourless latex present; corolla with long hairs on the inside, at least towards the base; corona of 5 minute lobes or teeth .... **Pleurostelma**

6b Stems erect, decumbent or prostrate, mainly herbaceous; rootstock often tubular:

9a Anther appendages ascending and covering the style head; style head conical above ..... **Stenostelma**

9b Anther appendages adpressed to sides of the style head but not covering it; style head mostly truncate or concave above with a slight central depression:

10a Pollinaria with very ornate caudicles considerably longer and broader than the pollinia ..... **Stathmostelma**

10b Pollinaria with caudicles shorter and narrower than the pollinia:

11a Corona lobes (behind the anthers) fleshy and solid without processes on ventral surface ..... **Xysmalobium** (in part) and **Glossostelma** (in part)

11b Corona lobes (behind the anthers) dorsiventrally flattened, or with margins folded inwards, or reduced to 5 minute lobes:

12a Corona lobes (behind the anthers) dorsiventrally flattened, lateral margins not folded inwards to form a cavity, sometimes adaxially keeled, or reduced to 5 minute lobes:

13a Corona reduced to 5 small to minute lobes ..... **Sphaerocodon**, **Pleurostelma** and **Glossostelma** (in part)

13b Corona well-developed:

14a Corona lobes (behind the anthers) spreading horizontally or curving outwards from the base, with keels on the inner face; usually fairly robust perennials ..... **Pachycarpus**

14b Corona lobes (behind the anthers) erect from the base:

15a Flowers in dense, globose, pedunculate heads ..... **Periglossum**

15b Flowers in sessile or pedunculate umbels:

16a Corona lobes thin; corpuscle linear; pollinia often with a pellucid germination zone ..... **Aspidoglossum**

16b Corona lobes thick to fleshy; corpuscle ovoid; pollinia without a pellucid zone ..... **Glossostelma** (in part) and **Xysmalobium** (in part)

12b Corona lobes (behind the anthers) flat, with lateral margins folded forward at least in part (usually strongly) to form a cavity (i. e. cucullate or complicate), with or without processes within the cavity:

17a Axils of leaves with minute bristles; flowers developing in gradual succession, spirally arranged around the elongating top of the peduncle ..... **Kanahia**

17b Axils of leaves without bristles; inflorescences umbellate (flowers radiating ± from a single point) with flowers all opening ± simultaneously:

18a Plants forming shrubs or trees 2–8 m high with cork-like bark and woody trunk, bearing inflated, ± smooth fruit 70–100 x 60–70 mm ..... **Calotropis**

18b Plants smaller, without woody trunk; fruit shorter than 60 mm and often covered with soft bristles:

19a Robust shrubs with many erect perennial branches; rootstock consisting of fibrous roots only, spreading just below the surface ..... **Gomphocarpus**

19b Few- to single-stemmed herbs with stems dying back to ground level in the dry season; rootstock thickened below the surface and often forming a tuber:

20a Plant usually consisting of a single slender erect stem with linear to ovate leaves:

21a Plant densely pubescent with spreading white hairs; usually with papillae in the cavities formed by the cucullate corona lobes ..... **Trachycalymma**

21b Plant glabrous to variously pubescent but not densely so; corona lobes glabrous:

22a Corona lobes delicate or slightly chartaceous, without a process on the inner face, and not fused into a ring at the base; corpuscle linear; pollinia often with a pellucid germination zone ... **Aspidoglossum**

22b Corona lobes transversely oblong, with an oblong to tongue-shaped process on the inner face, fused into a short ring at the base; without a pellucid germination zone ..... **Odontostelma**

20b Plant with several stems, stout and erect, or decumbent and then erect:

23a Stems strictly erect; leaves glabrous and glaucous; inflorescence nodding ..... **Gomphocarpus**

23b Stems initially horizontally spreading, then ascending; leaves scabrid and not glaucous; inflorescences erect ..... **Asclepias**

Acokanthera G.Don

(Plumerioideae—Carisseae)

Kupicha: 404 (1985); Endress & Bruyns: 37 (2000); Coates Palgrave: 943 (2002).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Adenium Roem. & Schult.

(Apocynoideae—Wrightieae)

Plaizier: 464 (1985); Endress & Bruyns: 39 (2000); Bingham & Smith: 140 (2002); Coates Palgrave: 959 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aidomene Stopp

(Asclepiadoideae—Asclepiadeae)

Stopp: 17 (1967).

Geophytic perennial herbs with grass-like habit and slender, flexuose stems and globose tuber. **Leaves** sessile, narrowly linear, subulate. **Flowers** in a terminal pseudo-umbel, on long erect pedicels. **Sepals** lanceolate, largely free, densely hairy. **Petals** ovate, twice as long as sepals, brown with white, membranous margin, glabrous. **Corona** simple, campanulate at base, ending in 5 white, ligulate-spathulate lobes almost twice as long as petals, and more conspicuous than petals, with margins involute at base, and with 2 wing-like excrescences inside margins near base forming a cup-like structure. **Pollinia** ovate, pellucid towards apex; caudicles short. **Follicles** always solitary, narrowly fusiform, erect at maturity.

Monotypic genus: *Aidomene parvula* Stopp, only known from Angola.

Alafia Thouars

(Apocynoideae—Malouetieae)

Thouars: 11 (1806); Pichon: 129 (1954); Kupicha: 489 (1985); Leeuwenberg: 769 (1997); Endress & Bruyns: 40 (2000).

Holalafia Stapf; Good: 88 (1929).

Scandent shrubs and lianes with milky latex; spines and tendrils absent. **Leaves** opposite, with a pair of triangular stipules sometimes joined into a single intrapetiolar scale, without acarodomatia or petiolar glands. **Flowers** borne in terminal umbellate cymes. **Calyx**: lobes imbricate, free to base, each overlapped margin with 1 or 2 delicate scales inside at base. **Corolla** hypocrateriform; tube ± cylindric, slightly wider at middle, glabrous on outer surface except for faint alternipetalous lines of puberulence, ± glabrous within except for a circle of long stiff downwards-pointing hairs below level of stamen insertion; corolla lobes 5, contorted, overlapping to the right, indumentum variable. **Stamens** 5, sessile, arising at about middle of corolla tube and with their tips reaching to mouth of tube; anthers conniving in a cone around gynoecium, polliniferous in upper part only, joined to clavuncle by a retinacle; dorsal surface of anthers often pubescent; disc absent. **Ovary** of 2 free, multi-ovulate carpels pubescent at apex; style glabrous, gradually dilated towards clavuncle, contracted and then widened into a capitate stigma. **Fruit** of 2 follicular mericarps. **Seeds** linear-compressed with an apical coma; endosperm absent.

Species ± 30, 11 native to Madagascar and the rest to trop. Africa; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Mozambique.

Alstonia R.Br.

(Rauvolfioideae—Alstonieae)

Brown: 64 (1810) conserved name; Stapf: 120 (1902); Huber: 68 (1963); De Jong: 1 (1979); De Jong: 985, 986 (1986).

Tall glabrous trees. **Leaves** in whorls of 3–6, more rarely opposite, with more than 25 pairs of lateral veins; stipules absent, but usually with many small colleters in a fringe or covering hollowed base of petiole. **Flowers** relatively small, usually in many-flowered, compound, terminal, umbelliform, corymbose or panicled inflorescences. **Calyx** small, divided almost to base; segments broadly ovate. **Corolla** salver-shaped; tube slender, cylindric, sparsely pubescent within, villous at mouth; lobes somewhat obliquely ovate, contorted, overlapping to right. **Stamens** in widened part of corolla tube; filaments filiform, short; anthers free from stigma, 2-lobed at base, polliniferous to base. **Disc** absent or obscurely annular. **Ovary** of 2 free carpels; style filiform, short; stigma with a ring of reflexed frills at base. **Mericarps** 2, follicular, cylindric, slender. **Seeds** oblong, compressed, with hairs all around edges, but chiefly at both ends.

Species ± 45, Old and New World tropics; sthn trop. Afr. 2, Angola (Cabinda).

Ancylobotrys Pierre

(Rauvolfioideae—Willughbeieae)

Huber: 60 (1963); Kupicha: 422 (1985); Endress & Bruyns: 35 (2000) as *Ancylobothrys*; Victor *et al.*: 78 (2000) as *Ancylobothrys*; White *et al.*: 134 (2001); Coates Palgrave: 949 (2002) as *Ancylobothrys*.

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Asclepias L.

(Asclepiadoideae—Asclepiadeae)

Binns: 19 (1968); Goyder: 247 (1997); Lebrun & Stork: 95 (1997); Goyder: 157 (2001).

Sthn trop. Afr. ± 10, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aspidoglossum E.Mey.

(Asclepiadoideae—Asclepiadeae)

Bullock: 417 (1952); Kupicha: 633 (1984); Müller *et al.*: 10 (2002).

Lagarinthus E.Mey.; Bullock: 420 (1952). *Schizoglossum* E.Mey. in broad sense, as to spp. from outside sthn Afr.; Norman & Moore: 95 (1929); Binns: 22 (1968); Martins: 58 (1994).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Baissea A.DC.

(Apocynoideae—Apocyneae)

De Kruif: 495 (1985a); Van Dilst: 89 (1995).

Zygodia Benth.; Good: 89 (1929).

Sthn trop. Afr. 12, Angola, Zambia, Malawi, and sthn Afr.

Batesanthus N.E.Br.

(Periplocoideae)

Brown: t. 2500 (1896); Brown: 253 (1902/1903); Norman & Moore: 91 (1929); Bullock: 203 (1961); Bullock: 82 (1963).

Woody climbers. **Leaves** opposite, petiolate, glabrous, rather thick, elliptic to oblong-ovate or subrotund, apex abruptly acuminate, base cordate; stipular fringes interpetiolar, reflexed, leathery, subpersistent. **Inflorescences** lax lateral panicles. **Calyx** small; sepals 5, almost free. **Corolla** rotate, deeply 5-lobed almost to base; lobes elliptic-ovate, rounded at apex. **Corona** annular, shortly 5-lobed; lobes emarginate, adnate to base of stamens. **Stamens** 5, arising inside corona; filaments short, free; anthers 4-locular, erect, narrowly oblong, cohering apically by triangular appendices over style head; translators (pollen presenters) with a rhomboid, deeply

divided blade on a short slender stalk; pollen granular, in tetrads. **Style head** shortly conical. **Follicles** fusiform, shortly beaked, ± woody, suberect, connate at base. **Seeds** ovate-lanceolate, flattened, acutely keeled on one side, blackish, fringed all around margin, but more densely at two ends, with very long white hairs.

Monotypic genus: *Batesanthus purpureus* N.E.Br., trop. W Africa; sthn trop. Afr.: Angola.

Brachystelma R.Br.

(Asclepiadoideae—Ceropegieae)

Percy-Lancaster: 63 (1988); Newton: 94 (1996); Peckover: 33 (1996); Peckover: 154 (1997); Victor & Nicholas: 205 (1998); Meve & Liede: 89 (2001); Mapaura & Timberlake: 162 (2002); Meve: 20 (2002b).

Dichaelia Harv.; Bullock: 358 (1953b). *Tenaris* E.Mey.; Brown: 472 (1903).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Callichilia Stapf

(Rauvolfioideae—Tabernaemontaneae)

Good: 86 (1929) as *Callichila*; Beentje: 1 (1978); Beentje: 449 (1985); Endress & Bruyns: 35 (2000); Coates Palgrave: 954 (2002).

Species 7, Africa; sthn trop. Afr. 2, Angola (Cabinda), Mozambique, and sthn Afr. (N KwaZulu-Natal).

Calotropis R.Br.

(Asclepiadoideae—Asclepiadeae)

White: 356 (1962); Binns: 20 (1968); Rahman &Wilcock: 301 (1991); Bingham (Unpublished).

Sthn trop. Afr. 1: *Calotropis procera* (Aiton) R.Br., widely distributed; possibly introduced; also in sthn Afr.

Carissa L.

(Rauvolfioideae—Carisseae)

Kupicha: 398 (1985); Endress & Bruyns: 37 (2000); Leeuwenberg & Van Dilst: 3 (2001); White *et al.*: 135 (2001); Coates Palgrave: 945 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Carvalhoa K.Schum.

(Rauvolfioideae—Tabernaemontaneae)

Schumann: 189 (1895); Leeuwenberg: 444 (1985a); Leeuwenberg: 47 (1985b); Endress & Bruyns: 35 (2000); White *et al.*:. 137 (2001).

Shrubs or small trees, repeatedly dichotomously branched and with 2 inflorescences in forks when flowering; with white latex. **Leaves** opposite, those of a pair equal or unequal, shortly petiolate or sometimes sessile; petioles or leaf bases of a pair united at the base and forming a very short ocrea, with a single row of colleters in axils; lamina elliptic, narrowly elliptic, or narrowly obovate, cuneate, rounded or subcordate at base. **Inflorescence** pedunculate, corymbose, pendulous, lax; bracts caducous before flowers open. **Flowers** regular except for the slightly curved corolla tube. **Calyx** pale green, persistent, even under fruit. **Corolla** white, creamy, or pale yellow, with many red longitudinal lines at base of lobes and at apex of tube; tube longer than calyx; lobes spreading(?) or suberect, in bud overlapping to the left. **Stamens** included; anthers sessile, narrowly triangular, acuminate at sterile apex, sagittate at base, hirto-pubescent outside on connective and inside between tails, introrse. **Ovary** glabrous, broadly ovoid, composed of 2 free carpels, surrounded by an entire disc, which is united with distal sides of ovary; style only slightly widened at apex; clavuncula composed of an entire, thin, slightly recurved ring and a subglobose head, topped by 2 parallel, linear, erect stigma lobes; style and stigma remaining on ovary when corolla is shed. **Fruit** composed of 2 free carpels which usually both develop and which dehisce adaxially; wall soft, orange inside. **Seeds** in 2 irregular rows, surrounded by a darker orange pulpy aril, few, rather large, obliquely ellipsoid or ovoid; at hilar side with one deep groove to half their width, less deeply grooved at the other sides, minutely pustulate; endosperm copious, starchy, creamy, ruminate, surrounding the spathulate embryo.

Monotypic: *Carvalhoa campanulata* K.Schum., trop. Africa; sthn trop Afr.: Malawi, Mozambique.

*Catharanthus G.Don

(Rauvolfioideae—Vinceae)

Plaizier: 453 (1985).

C. roseus (L.) G.Don, indigenous to Madagascar but a widespread, sometimes cultivated weed throughout the tropics; also in sthn Afr.

Ceropegia L.

(Asclepiadoideae—Ceropegieae)

Norman & Moore: 98 (1929); Huber: 1 (1957); Stopp: 115 (1964); Stopp: 469 (1971); Lisowski & Malaisse: 401 (1974); Dyer: 43 (1980); Dyer: 133 (1983); Boele: 37 (1988); Masinde & Meve: 205 (2002); Meve: 63 (2002c).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chamaeclitandra (Stapf) Pichon

(Rauvolfioideae—Willughbeieae)

White: 347 (1962); Kupicha: 416 (1985); Leeuwenberg & Berndsen: 165 (1988).

Clitandra henriquesiana K.Schum. ex Warb.; Good: 84 (1929).

Rhizomatous shrubs with straight stems; latex present, abundant in rootstocks; spines and tendrils absent. **Leaves** very neatly arranged, of uniform shape, characteristically deflexed on stem, ovate to lanceolate, with distinct round-tipped acumen and obtuse base, petiolate; stipules absent. **Inflorescences** compact, terminal and lateral, few-flowered cymes. **Calyx**: lobes ± free to base. **Corolla** hypocrateriform; tube glabrous without, pilose within around stamens and near mouth; lobes contorted, overlapping to the left, ± equalling tube, glabrous or ciliate. **Stamens** arising in lower third of tube, anthers subsessile, without carina. **Ovary** hairy; ovules few, in 2 series in each locule; style, clavuncle and stigma very short. **Fruit** a few-seeded glabrous berry without sclerified pericarp.

Monotypic African genus: *Chamaeclitandra henriquesiana* (Hallier f.) Pichon; sthn trop. Afr.: Angola, Zambia. Fruit edible; with refreshing taste.

Cibirhiza Bruyns

(Asclepiadoideae—Marsdenieae)

Bruyns: 51 (1988); Kunze *et al.*: 367 (1994); Endress & Bruyns: 46 (2000); Meve: 107 (2002d).

Perennial herbs or shrublets with milky sap. **Stems** prostrate to scrambling; tuber turnip-shaped, up to 0.3 m (or more?) in diameter. **Leaves** opposite, deciduous, broadly ovate to obovate; petiole $^1/_2$ to almost as long as blade; 1–3 colleters at base of leaf. **Inflorescence**: 5–10(–20)-flowered, umbelliform axillary clusters; floral bracts ovate, ciliate, small. **Sepals** ovate, obtuse, without colleters. **Corolla** rotate; tube shallowly campanulate; lobes triangular, ± as long as tube, spreading. **Corona** double, purple-brown, composed of: (1) an outer ring of staminal and interstaminal portions, with the 5 interstaminal portions each forming a nectar cup below guide rails; (2) 5 inner free parts, each consisting of 3 members, all overtopping staminal column; lower (outer) ± narrowly triangular member sheathing 2 subulate inner members of which the innermost one ends in an erect filiform adaxial appendage twice as long as remainder of corona. **Staminal column**: filaments fused, forming a cylindric tube surrounding ovaries; top of filament tube adpressed to proximal surface of style head except in the 5 interstaminal corners where it is detached, leaving openings through which stigmatic area is exposed to adaxial side of guide rails (stigmatic chamber). **Style head** pentagonal, salver-shaped, developing glandular areas in its 5 corners. **Fruits** and **seeds** unknown. $x = 11$.

Species 2, 1 in Oman; 1: *Cibirhiza albersiana* H.Kunze, Meve & Liede, in Zambia.

Clitandra Benth.

(Rauvolfioideae—Willughbeieae)

Bentham: 445 (1849); Leeuwenberg & Berndsen: 159 (1988).

Large lianas climbing up to 40 m high in trees; latex white; branches densely lenticellate. **Leaves** opposite, shortly petiolate, arising on leaf cushions; simple, entire, elliptic to narrowly elliptic, acuminate with a long obtuse point, cuneate at base; secondary veins in 6–16 pairs. **Inflorescences** axillary, single or paired, thyrsoid, with 10–80 flowers, congested or lax; lower bracts sepal-like, deciduous. **Flowers** fragrant (like *Jasminum*). **Sepals** green, ovate, equal or subequal, ± pubescent outside, without colleters. **Corolla** urceolate; lobes narrowly oblong to narrowly obovate. **Stamens** included, arising shortly above base of corolla; filaments very short, incurved, glabrous; anthers ovate, with some hairs at apex, introrse, pendent or pointing towards centre. **Ovary** broadly ovoid, 1-locular but often apparently 2-locular due to the 2 parietal placentas almost connate at base and at apex; each placenta with 6–15 ovules; style cylindric, glabrous; pistil head conical, glabrous. **Fruit** a fleshy, globose or pyriform berry with seeds embedded in a red, fibrous, acid pulp. **Seeds** 6–25, ovoid, black; testa thin, smooth; endosperm copious.

Monotypic genus: *Clitandra cymulosa* Benth., trop. Africa; sthn trop. Afr.: Angola.

Crioceras Pierre

(Rauvolfioideae—Tabernaemontaneae)

Pierre: 1311 (1897); Stapf: 128 (1902); Good: 87 (1929); Hallé: 301 (1971).

Glabrous shrubs, climbers or small trees. **Leaves** opposite, decussate; leaves of a pair equal or ± unequal; petiole very short or 0; blade obovate, acuminate or subobtuse with obtuse to cordate, sometimes slightly asymmetric base; intrapetiolar stipules present. **Inflorescence** pseuo-axillary or terminal, few- to 1-flowered, situated at point of branching of 2 second order branches. **Flower** large, white, pendent, fragrant, supported by 2 large foliaceous bracts. **Calyx** of 5 free, subequal, ovate-lanceolate, attenuate sepals, each with several colleters on inside. **Corolla**: tube slender and cylindric to above middle, then funnel-shaped-campanulate or campanulate; lobes broadly ovate-oblong, overlapping to left. **Stamens** arising at point of constriction of corolla tube; anthers subsessile, conniving in a cone, free from stigma, linear-lanceolate, acute, subsagittate, tails subobtuse, empty, solid. **Disc** annular, fleshy, adnate to ovary. **Carpels** 2, connate at base, style filiform; stigma at level of anthers, oblong, 5-grooved, minutely apiculate; ovules many, in many rows. **Mericarps** 2, follicular, diverging, globose or lanceolate-oblong with 2 lateral keels or wings, thinly leathery when dry, tardily dehiscent. **Seeds** ellipsoid, ventrally deeply grooved, coated with a thin aril; testa crustaceous; endosperm horny, deeply ruminated; cotyledons transverse, flat, thin, much shorter than radicle.

Monotypic genus: *Crioceras dipladeniiflorus* (Stapf) K.Schum., tropical W Africa; sthn trop. Afr.: Angola (Cabinda).

Cryptolepis R.Br.

(Periplocoideae)

Bullock: 279 (1955b); Venter & Verhoeven: 713 (1997); Venter & Verhoeven: 564 (2001).

Curroria Planch. ex Benth.; Bullock: 360 (1953b); Bullock: 359 (1954). *Ectadiopsis* Benth.; Bullock: 267 (1955b); Binns: 20 (1968). *Mangenotia* Pichon; Bullock: 587 (1955a).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cylindropsis Pierre

(Rauvolfioideae—Willughbeieae)

Pierre: 38 (1898); Haegens: 316 (1994).

Clitandra sect. *Cylindropsis* (Pierre) Stapf: 61 (1902).

Robust lianas with white latex; branches grey-brown with many lenticels. **Leaves** opposite, petiolate, glabrous, narrowly elliptic to obovate, apex apiculate, often with a long acumen, with 7–14 pairs of conspicuous secondary veins. **Inflorescences**: 3–20-flowered ± congested cymes, axillary or sometimes also terminal; peduncle and pedicels glabrous. **Sepals** 5, small, ovate, ciliate; colleters absent. **Corolla** salver-shaped; tube ± cylindric, widening in upper half, usually glabrous outside and below stamens on inside, variously hairy above stamens; lobes 5, narrowly oblong-triangular, half as long to as long as tube. **Stamens** included; filaments ± half as long as anthers, usually with a tuft of hairs around base; anthers narrowly ovate, apiculate, dehiscing to base. **Ovary** subglobose, variously pubescent in upper part, 1(2)-locular, gradually narrowing into a glabrous filiform style; style head clavate with 2-lobed stigmoid apex. **Fruit** a syncarpous, globose to ovoid, many-seeded berry; pericarp smooth; pulp creamy, slimy. **Seeds** ellipsoid; testa thin; endosperm thin; cotyledons ellipsoid.

Monotypic genus: *Cylindropsis parvifolia* Pierre, tropical W Africa; sthn trop. Afr.: Angola (Cabinda).

Cynanchum L.

(Asclepiadoideae—Asclepiadeae)

Bullock: 354 (1953b); Bullock: 621 (1956); Binns: 20 (1968); Liede: 503 (1993); Liede: 283 (1996a).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dictyophleba Pierre

(Rauvolfioideae—Willughbeieae)

Pierre: 92 (1898); Kupicha: 420 (1985); De Hoogh: 207 (1989).

Landolphia P.Beauv., in part.

Tendrillous lianes climbing to 15 m and more; latex abundant; spines absent. **Leaves** obovate, oblong-obovate or elliptic, base shortly auricled; petiolate; stipules interpetiolar. **Inflorescences** loose, elongate terminal panicles of few-flowered cymes. **Flowers** sweet-scented. **Calyx**: lobes imbricate, free to base, with conspicuous glandular auricles **Corolla** hypocrateriform; tube cylindric, slightly enlarged at level of anthers; lobes narrowly linear, contorted, overlapping to the left, long-ciliate on inner margins. **Stamens** inserted in corolla tube between $^1/_4$ and $^3/_4$ of its length; filaments very short; anthers without carina. **Ovary** glabrous, multi-ovulate; clavuncle positioned at base of anthers. **Fruit** a many-seeded glabrous berry lacking a sclerified layer in pericarp.

Species 5, African; sthn trop. Afr. 1: *Dictyophleba lucida* (K.Schum.) Pierre, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Diplorhynchus Welw. ex Ficalho & Hiern

(Rauvolfioideae—Melodineae)

White: 348 (1962); Plaizier: 451 (1985); Coates Palgrave: 951 (2002); Bingham (Unpublished).

Monotypic genus: *Diplorhynchus condylocarpon* (Muell. Arg.) Pichon, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Duvalia Haw.

(Asclepiadoideae—Ceropegieae)

Meve: 1 (1997); De Kock: 28 (2000b).

Sthn trop. Afr. 1: *Duvalia polita* N.E.Br., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Emicocarpus K.Schum. & Schltr.

(Asclepiadoideae—Asclepiadeae)

Schumann & Schlechter: 21 (1900).

Perennial herbs with slender, terete, prostrate stems minutely puberulous along one line when young. **Leaves** petiolate, hastate, deeply, almost palmately incised into 5 or 7 very narrowly triangular lobes, middle lobe twice as long or more than lateral ones; petiole canaliculate above. **Inflorescences** few-flowered, axillary umbels on long peduncles minutely pilose along one line. **Flowers** pedicellate; bracteoles minute, subulate. **Sepals** oblong-lanceolate, acuminate, with solitary interposed finger-shaped colleters. **Corolla** rotate, with glabrous lobes overlapping to the right. **Corona** triple: outer one of tongue-shaped, obtuse lobes opposite the petals; middle one of 10 paired, slightly longer and narrower lobes alternating with lobes of outer corona; lobes of inner corona similar to those of outer corona but somewhat smaller and opposite stamens and slightly adnate to corolla. **Stamens** ending in a 2-lobed, membranous connective; corpuscle very small; translator arms twisted. **Style head** swollen, ellipsoid, raised well above gynostegium. **Ovary** with two ovules. **Follicles** resembling fruit of *Emex*: with 3 spines, 2 lateral and 1 apical; pedicel short and spiny. **Seed** horseshoe-shaped, brown.

Monotypic genus: *Emicocarpus fissifolius* K.Schum. & Schltr. This incredible plant was recorded from near Maputo, coastal Mozambique.

Fockea Endl.

(Asclepiadoideae—Marsdenieae)

Court: 69 (1987); Marloth: 67 (1987); Kunze *et al.*: 367 (1994); Endress & Bruyns: 17 (2000).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, ?Malawi, Mozambique, and sthn Afr.

Funtumia Stapf

(Apocynoideae—Malouetieae)

Stapf: 2 (1899); Good: 88 (1929); Zwetsloot: 484 (1985); Zwetsloot: 966, 967 (1986); Coates Palgrave: 958 (2002).

Evergreen trees or shrubs, with white sticky latex; bark smooth, sometimes with a few lenticels; wood of low density, soft; branches terete, sometimes lenticellate, very dark brown; branchlets smooth, terete or laterally compressed with a longitudinal groove below the ocrea. **Leaves** opposite, petiolate, those of a pair connate into a short ocrea, with many small colleters in 2 or 3 rows in axils; lamina ovate, elliptic or oblong, decurrent into petiole, acuminate at apex, entire, glabrous above; often with domatia in axils of secondary veins; margin both undulate and revolute. **Inflorescences** congested, terminal and axillary, cymose, much shorter than leaves; peduncle short; bracts ovate or elliptic, often with small colleters in axils. **Flowers** regular, fleshy, fragrant. **Sepals** free, thick, ovate or nearly so, obtuse or subacute at apex, often membranous and minutely ciliate at margin, inside with a single row of colleters at base. **Corolla**: tube ventricose at middle, inside thickened at throat, densely hirtopubescent from insertion of stamens to level of apex of ovary; lobes overlapping in bud to the right, entire, recurved. **Stamens** included; filaments very short or absent; anthers narrowly triangular, introrse. **Ovary** of 2 almost free carpels united by base of style; clavuncula grading into a conical stigma; disc 5-lobed; ovules pendulous. **Follicles** 2, connate at base. **Seeds** slender, fusiform, apex with long straight hairs; testa rugose; embryo straight.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola, Zimbabwe, Malawi, Mozambique.

Glossostelma Schltr.

(Asclepiadoideae—Asclepiadeae)

Bullock: 414 (1952); Binns: 21 (1968); Goyder: 527 (1995).

Slender or robust, erect perennial herbs with a short, often stout vertical rhizome with fusiform lateral roots; stem usually solitary, simple, often with a line of pubescence running along stem. **Leaves** usually petiolate, linear to ovate or

spathulate. **Inflorescences** umbelliform, with or without peduncle, arising terminally and axillary at upper 1–4(–6) nodes. **Corolla** campanulate, lobed almost to base, medium to large. **Corona** 5-lobed, often fleshy, united very shortly at base and attached to staminal column near base of anthers; staminal column usually with a conspicuous stalk below attachment of corona lobes. **Style head** 5-angled, generally ± level with top of anthers and largely obscured by anther appendages; corpuscle ovoid, brown or black; caudicles flattened, held ± at right angles to axis of corpuscle; pollinia pendulous, flattened. **Follicles** erect, lanceolate or ovate-lanceolate in outline, apex attenuate; fruiting pedicel not contorted; usually only 1 follicle developing. **Seeds** flattened with one face convex, ovate to ± circular in outline with a narrow convoluted rim surrounding a verrucose disc.

Species 12, trop. Africa; sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Gomphocarpus R.Br.

(Asclepiadoideae—Asclepiadeae)

Bullock: 406 (1952); Bullock: 339 (1953b); Bruyns: 165 (1995); Goyder & Nicholas: 769 (2001).

Asclepias L., in part; Brown: 313 (1902/1903).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gongronema (Endl.) Decne.

(Asclepiadoideae—Marsdenieae)

Bullock: 196 (1961).

Dregea E.Mey.; Bullock: 512 (1957); Binns: 20 (1968). *Gymnema* R.Br.; White: 359 (1962); Binns: 21 (1968). *Marsdenia* of various authors, in part, not of R.Br.; Norman & Moore: 97 (1929); Bullock: 364 (1954); Bullock: 287 (1955b); Bullock: 510 (1956); Bullock: 510 (1957); White: 359 (1962).

Perennal vines or subshrubs, glabrous. **Leaves** opposite. **Inflorescences** umbel-like cymes or umbels. **Calyx** 5-partite, small, ovate-acuminate. **Flowers** small or of moderate size. **Corolla** campanulate, often constricted at the throat; lobes erect to spreading, overlapping to the left. **Corona** of 5 small, wart-like fleshy lobes with basal parts adnate to staminal column. **Anthers** 2-locular, terminated by membranous appendages which are free or connate. **Pollinia** sessile, erect, attached by short to elongated caudicles. **Style head** conical or truncate. **Follicles** with a thick pericarp, smooth, sometimes winged. **Seeds** crowned with a tuft of hairs.

Species ± 20, Old World tropics; sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Holarrhena R.Br.

(Apocynoideae—Malouetieae)

De Kruif: 456 (1985a); De Kruif: 969, 971 (1986); Coates Palgrave: 951 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hoodia Sweet ex Decne.

(Asclepiadoideae—Ceropegieae)

Bruyns: 145 (1993); Plowes: 3 (1996); De Kock: 30 (2000b); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 4, Angola, Zimbabwe, and sthn Afr.

Huernia R.Br.

(Asclepiadoideae—Ceropegieae)

Kers: 179 (1969); Kimberley: 60 (1986); Leach: 1 (1988); De Kock: 31 (2001a); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hunteria Roxb.

(Rauvolfioideae—Hunterieae)

Roxburgh: 531 (1824); Kupicha: 430 (1985); Omino: 88 (1996); Coates Palgrave: 956 (2002).

Shrubs or trees up to 40 m high; stems and leaves completely glabrous; latex present; spines and tendrils absent. **Leaves** opposite, oblong to elliptic, entire, ± concolorous; petiolate; stipules absent. **Inflorescences** cymose, terminal, rarely also axillary, few- to many-flowered; pedicels present, up to 10 mm long. **Calyx** glabrous; lobes free or connate at extreme base, herbaceous, imbricate, not revolute, with colleters inside covering part of ventral surface of sepals. **Corolla** hypocrateriform, externally glabrous, internally hairy above and below stamens; tube not developing splits (as in *Pleiocarpa)*; lobes contorted, overlapping to the left, not ciliate. **Stamens** included, arising at or above middle of corolla tube; filaments short, anthers dorsifixed, longitudinally dehiscent, introrse, without carina. **Ovary** of 2 separate, glabrous mericarps diverging at 90–180°, with 2–30 ovules per mericarp; pistil head composed of a subglobose basal stigmatic part and a stigmoid apex. **Fruit** composed of 2 separate diverging subglobose to obovoid, fleshy to fibrous mericarps. **Seeds** somewhat angular, smooth, brown; embryo straight, spathulate, surrounded by thick, rather starchy and hard endosperm, leaving a hole around radicle base; cotyledons thin, leafy, radicle almost cylindric.

Species 12, trop. Africa with 1 of them also in tropical Asia; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

Kanahia R.Br.

(Asclepiadoideae—Asclepiadeae)

Bullock: 421 (1952); Field *et al.*: 787 (1986); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 1: *Kanahia laniflora* (Forssk.) R.Br., Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Landolphia P.Beauv.

(Rauvolfioideae—Willughbeieae)

White: 349 (1962); Kupicha: 408 (1985); Persoon *et al.*: 6 (1992); Endress & Bruyns: 35 (2000); White *et al.*: 138 (2001); Coates Palgrave: 949 (2002).

Aphanostylis Pierre; White: 347 (1962); Huber: 418 (1985); *Carpodinus* R.Br. ex G.Don; Good: 84 (1929).

Sthn trop. Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Margaretta Oliv.

(Asclepiadoideae—Asclepiadeae)

Bullock: 411 (1952); Mwanyambo: 717 (1996).

Herbaceous perennials with a carrot-shaped tuberous rootstock; stems usually simple. **Leaves** opposite, subsessile. **Inflorescence** terminal and lateral, umbellate. **Corolla** deeply 5-lobed, commonly revolute. **Corona** 5-lobed, petaloid, more showy than corolla, variable in shape, 2- or 3-toothed on claw. **Style head** capitate, hemispherical, subconical, truncate or obtuse. **Follicles** in pairs, fusiform, beaked, smooth, pubescent; fruiting pedicel not contorted.

Monotypic genus: *Margaretta rosea* Oliv., trop. Africa; sthn trop. Afr. 2 subspecies, Zambia, Zimbabwe, Malawi, Mozambique.

Mascarenhasia A.DC.

(Apocynoideae—Malouetieae)

Candolle: 487 (1844); Kupicha: 487 (1985); White *et al.*: 141 (2001); Coates Palgrave: 958 (2002).

Lanugia N.E.Br.; Burtt Davy *et al.*: 27 (1958).

Shrubs or small trees with milky latex; spines and tendrils absent. **Leaves** opposite, obovate-oblong, oblong or elliptic; with petiolar glands; without domatia; stipules absent. **Flowers** often large and conspicuous, solitary or in few-flowered fasciculate cymes, terminal. **Calyx**: lobes imbricate, free to base, with many glandular scales inside at base. **Corolla** hypocrateriform; tube divided into 2 distinct regions of varying shape and proportions; lobes 5, with induplicate aestivation, straight in bud or twisted to the right. **Stamens** 5, sessile, inserted at base of upper region of corolla tube; anthers conniving in a cone around gynoecium, polliniferous in upper part only, joined to clavuncle by a retinacle. Receptacular disc cupular or represented by separate oppositipetalous scales, these sometimes united in pairs. **Ovary** of 2 free multi-ovulate carpels, glabrous or hairy; style pubescent; clavuncle swollen; stigma pointed or flared at apex, not bifid. **Fruit** of 2 follicular mericarps. **Seeds** linear-compressed with an apical coma; endosperm absent.

Species 10, 9 endemic to Madagascar and 1 distributed from Madagascar and the Comores to trop. Africa; sthn trop. Afr. 1: *Mascarenhasia arborescens* A.DC., Zimbabwe, Malawi, Mozambique.

Mondia Skeels

(Periplocoideae)

Bullock: 203 (1961); Bullock: 82 (1963); White *et al.*: 162 (2001); Mapaura (Unpublished); Phiri (Unpublished)

Chlorocodon Hook.f.; Brown: 254 (1902/1903); White: 356 (1962); Binns: 20 (1968).

Species 2, trop. Africa; sthn trop. Afr. 1: *Mondia whitei* (Hook.f.) Skeels, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr..

Motandra A.DC.

(Apocynoideae—Apocyneae)

Candolle: 423 (1844); Stapf: 224 (1902); De Kruif: 973, 974 (1986).

Scandent shrubs. **Leaves** opposite, secondary veins distant; stipules and axillary glands absent. **Inflorescences**: terminal, rather loose panicles; flowers inconspicuous. **Calyx** small, divided almost to base; sepals imbricate, ovate, obtuse. **Corolla** somewhat funnel- to salver-shaped; tube ± cylindric, with 5 longitudinal grooves outside and corresponding ridges inside descending from sinuses to middle and there touching a ring of hairs consisting of 5 suprastaminal arches; mouth naked; lobes linear-oblong or ovate, overlapping to the right. **Stamens** arising above base of corolla tube; filaments filiform-clavate, short; anthers sagittate, conniving into a cone, included, linear, terminating in a minutely plumose mucro; appendages slightly shorter than polliniferous part; tails short, obtuse, recurved; foot of connective projecting. **Disc** cupular, 5-lobed, fleshy. **Carpels** free, slightly inferior, adnate to disc up to or beyond middle; style very short; stigma spindle-shaped, with 2 linear lobes; ovules many, in many rows. **Mericarps** 2, follicular, lanceolate in outline, divaricate. **Seeds** oblong, with a long deciduous apical coma; endosperm scanty.

Species 10, W trop. Africa; sthn trop. Afr. 2, Angola.

Neoschumannia Schltr.

(Asclepiadoideae—Ceropegieae)

Schlechter: 38 (1905); Liede & Kunze: 275 (1993); Meve: 233 (1995); Mapaura & Timberlake: 178 (2002).

Swynnertonia S.Moore.

Large, woody climbers with slender stems, glabrous; latex clear. **Leaves** large, with long petioles, elliptic to broadly ovate. **Inflorescences** 3- to many-flowered, extra-axillary, pedunculate, bostrychoid, lax, with small floral bracts; pedicels filiform, ± pendulous. **Calyx** fused at its swollen base, one colleter in each intersepal sinus. **Petals** not fused at base, lanceolate, lax. **Corona** gynostegial, tripartite [formula: C(is) + Cs]: Staminal corona (Cs) is supported by a C(is) consisting of interstaminal lobes connate to a skirt with appendages predominantly developed in staminal position; skirt membranous, basally ± fused, interstaminal parts of C(is) sickle-shaped, bidentate, villous; staminal corona lobes (Cs) erect, lanceolate to obovate, with a basal hump. **Gynostegium** borne on a column; guide rails short, oblique, protruding. **Anthers** subquadrangular; pollinarium (sub)erect, pollinia broadly ovate to quadrangular, with pellucid germination mouth on inner margin, yellow, corpusculum elliptic; style head flat or depressed, white. **Follicles** long, slender, glabrous. **Seeds** not seen.

Species 2, trop. Africa; sthn trop. Afr. 1: *Neoschumannia cardinea* (S.Moore) Meve, Zimbabwe.

Odontostelma Rendle

(Asclepiadoideae—Asclepiadeae)

Rendle: 161 (1894); Norman & Moore: 96 (1929); Bullock: 619 (1956).

Schizoglossum as to *S. welwitschii* (Rendle) N.E.Br.: 365 (1902/1903); Kupicha: 669 (1984).

Perennial, glabrous herbs with a solitary, slender, erect stem; tuber carrot-like with long neck. **Leaves** linear with revolute

margins. **Inflorescence** lateral, 4–6-flowered umbels; bracts absent or minute; flowers greenish brown. **Sepals** lanceolate, acute. **Corolla** broadly campanulate, 5-lobed nearly to base; lobes spathulate. **Corona** arising at base of staminal column, not reaching base of anthers, shortly annular at base, divided into 5 transversely oblong, truncate lobes with sides incurved at apex and with an oblong or tongue-shaped process on inner face at middle slightly longer than rest of lobe. **Stamens**: anther appendages small, ovate, acute, inflexed over apex of style.

?Monotypic: *Odontostelma welwitschii* Rendle, only known from sthn trop. Afr.: Angola, Zambia, Zimbabwe. The status of this species is uncertain.

Oncinotis Benth.

(Apocynoideae—Apocyneae)

De Kruif: 5 (1985b); Kupicha: 492 (1985); De Kruif: 977, 978 (1986); White *et al.*: 142 (2001); Coates Palgrave: 961 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Orbea Haw.

(Asclepiadoideae—Ceropegieae)

Leach: 287 (1975); Leach: 4 (1978); Kimberley: 61 (1986); Bruyns: 72 (2000c); De Kock: 34 (2001a).

Caralluma R.Br., in part; Norman & Moore: 100 (1929); Binns: 20 (1968); Kimberley: 60 (1986). *Diplocyatha* N.E.Br. *Stultitia* E.Phillips. *Orbeopsis* L.C.Leach: 61 (1978); Kimberley: 62 (1986); Mapaura & Timberlake: 162 (2002). *Pachycymbium* Lindl.; Leach: 69 (1978); Kimberley: 62 (1986); De Kock: 4 (2001b); Mapaura & Timberlake: 162 (2002). *Angolluna* Munster; De Kock: 29 (2000a).

Species 55, 31 in Africa S of the equator, 25 N of the equator and the Arabian Peninsula; sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Orthanthera Wight

(Asclepiadoideae—Ceropegieae)

Brown: 433 (1903); Norman & Moore: 98 (1929); Phiri (Unpublished).

Sthn trop. Afr. 3, Angola, Zambia, and sthn Afr.

Pachycarpus E.Mey.

(Asclepiadoideae—Asclepiadeae)

Bullock: 329 (1953b); Kupicha: 667 (1984); Smith: 399 (1988); Goyder: 335 (1998a); Goyder: 882 (1998c).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pachypodium Lindl.

(Apocynoideae—Malouetieae)

Norman & Moore: 90 (1929); Codd: 283 (1963); Kupicha: 462 (1985); Rapanarivo *et al.*: 1 (1999); Coates Palgrave: 959 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique, and sthn Afr.

Pentarrhinum E.Mey.

(Asclepiadoideae—Asclepiadeae)

Liede & Nicholas: 475 (1992).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pergularia L.

(Asclepiadoideae—Asclepiadeae)

Brown: 323 (1907); Brown: 757 (1907–1909); Binns: 21 (1968); Liede: 63 (1990); Liede: 481 (1996c); Mapaura (Unpublished).

Daemia R.Br.; Norman & Moore: 96 (1929).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Periglossum Decne.

(Asclepiadoideae—Asclepiadeae)

Schlechter: 32 (1905); Brown: 581 (1907–1909); Liede & Albers: 214 (1994); Victor *et al.*: 89 (2000).

Sthn trop. Afr. 1: *Periglossum mossambicense* Schltr., Mozambique, and sthn Afr. This genus is not listed in Endress & Bruyns (2000).

Periploca L.

(Periplocoideae)

Schumann: 216 (1895); Brown: 256 (1902/1903); Norman & Moore: 91 (1929); Binns: 21 (1968); Venter: 123 (1997); White *et al.*: 163 (2001); Mapaura & Timberlake: 168 (2002) under Periplocaceae.

Parquetina Baill.; Bullock: 204 (1961); White *et al.*: 162 (2001).

Twining or erect shrubs, glabrous; with milky latex. **Leaves** opposite, sometimes absent, herbaceous or coriaceous. **Flowers** small to medium-sized, in lax axillary or terminal cymes. **Calyx** 5-partite; lobes short; 5 intersepalar glands. **Corolla** rotate, 5-lobed nearly to base; lobes overlapping, slightly twisted. **Corona** of 5 filiform or linear lobes, arising from corolla at or a little above insertion of stamens and opposite them, simple or divided, with or without a ± broadly dilated base which is often ± spreading and adnate to base of corolla lobes and usually 2-keeled within. **Stamens** arising from corolla a little above its base; filaments free, short; anthers adnate to style at their base, with connective produced into an apiculus by which they are usually connate at their tips. **Style** shorter than anthers, convex or subtruncate at apex; translators spoon-shaped. **Follicles** smooth. **Seeds** crowned with a tuft of hairs.

Species 14, Mediterranean to E Asia and trop. Africa; sthn trop. Afr. 2, Angola, Malawi.

Picralima Pierre

(Rauvolfioideae—Hunterieae)

Pierre: 1278 (1896); Stapf: 96 (1902); Good: 85 (1929); Pichon: 81 (1953a); Omino: 128 (1996).

Trees or shrubs with white latex in all parts; branchlets glabrous. **Leaves** opposite, petiolate, those of a pair equal or subequal, elliptic to oblong, entire, glabrous. **Inflorescence** a compound, umbellate cyme, terminal or sometimes axillary, pedunculate. **Flowers** ± regular, fragrant. **Sepals** connate at extreme base, imbricate, glabrous outside, with 2–4 rows of colleters at base. **Corolla** white to yellow, tube almost cylindric, often greenish, glabrous outside, pubescent inside below stamens; lobes overlapping to left in bud, entire, glabrous,

spreading and later recurved. **Stamens** arising above middle of corolla tube, included; filaments very short, filiform, glabrous; anthers ovate in outline, cordate at base, glabrous, thecae 2, parallel, longitudinally dehiscent. **Ovary** of 2 separate glabrous carpels united at base by a disc-like thickening; ovules many per carpel; pistil head composed of a basal cylindric stigmatic part and a filiform stigmoid apex. **Fruit** composed of 2 separate divaricate, obovoid to ellipsoid mericarps with rounded apex and containing up to 80 seeds. **Seeds** somewhat angular, smooth, brown; testa hard; embryo straight, spathulate, surrounded by thick, rather hard starchy endosperm leaving a hole around radicle apex, cotyledons thick.

Monotypic genus: *Picralima nitida* (Stapf) T. & H.Durand, trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Pleiocarpa Benth.

(Rauvolfioideae—Hunterieae)

Bentham: 685, 699 (1876); Good: 85 (1929); Pichon: 123 (1953a); Kupicha: 432 (1985); Omino: 134 (1996); Endress & Bruyns: 36 (2000); Coates Palgrave: 950 (2002).

Evergreen shrubs or trees; stems and leaves completely glabrous; white latex present in all parts; spines and tendrils absent. **Leaves** opposite or in whorls of 3–5, elliptic to obovate; petiole angled, often narrowly winged; stipules absent. **Inflorescences** cymose, axillary, rarely also terminal; pedicels short or absent. **Calyx** glabrous; lobes free to base, herbaceous, imbricate, not revolute, without scales on inner surface. **Corolla** hypocrateriform, externally glabrous, internally pubescent below stamens; tube often with 5 splits developing at level of stamens; lobes contorted, overlapping to the left, not ciliate. **Stamens** arising at or above middle of corolla tube; filaments short; anthers dorsifixed, introrse, longitudinally dehiscent. **Ovary** glabrous, composed of 2–5 separate carpels, with 1–4 ovules per carpel; clavuncle present; stigma reduced to a sessile area or rarely represented by a rudimentary apiculus. **Fruit** a compound berry of 2 variously shaped, fleshy to slightly fibrous mericarps with a rounded to hook-shaped apex. **Seeds** variously shaped, with smooth brown testa; embryo straight, spathulate, surrounded by a thick, rather starchy and hard endosperm, leaving a hole around radicle base; cotyledons elliptic, thin and leafy, radicle almost cylindric.

Species ± 5, trop. Africa; sthn trop. Afr. 2(?3), Angola, Zambia, Zimbabwe, Mozambique.

Pleioceras Baill.

(Apocynoideae—Wrightieae)

Baillon: 759 (1888); Barink: 482 (1985); Barink: 1004, 1005 (1987); Endress & Bruyns: 39 (2000); Coates Palgrave: 965 (2002).

Shrubs, lianas or trees up to 9 m high, with white latex; branches unarmed, with pale lenticels; branchlets terete, often sulcate when dry. **Leaves** opposite, those of a pair equal or subequal, shortly petiolate, with colleters in 1 or 2 rows in axils; lamina acuminate, rounded or cuneate at base. **Inflorescences** terminal, paniculate, several- to many-flowered, lax; lower bracts leafy; others narrowly oblong, acute, with colleters in axils. **Flowers** regular except for sometimes slightly unequal sepals, small. **Calyx** persistent beneath fruit; sepals green, connate at base, ovate, imbricate, entire, pubescent or glabrous outside, ciliate inside at base near edge with 0 or 1 triangular or ovate colleters (in whole flower 3–10). **Corolla** ± trumpet-shaped; tube ventricose in middle, outside glabrous at base and minutely pubescent at apex; lobes overlapping to left in bud, elliptic, rounded, entire, ciliate. **Stamens** exserted, but covered by appendages; filaments short, filiform, glabrous outside; anthers introrse, sagittate at base, apiculate and pilose at apex, fertile for $^1/_2$ of length just below apices. **Pistil** glabrous or sometimes with a few papillae; ovary superior, subglobose; carpels 2, free, rounded; disc none; style split at base; stigma minute, bilobed; ovules many, in several rows. **Follicles** 2, spreading, almost free, pendulous, slender, adaxially dehiscent, glabrous outside. **Seeds** many, in two or more rows, linear to very narrowly oblong, finely grooved, glabrous, with a ± dense tuft of retrorse hairs at apices; embryo large, surrounded by very scanty whitish endosperm.

Species 5, trop. Africa; sthn trop. Afr. 2, Angola, Mozambique.

Pleurostelma Baill.

(Asclepiadoideae—Asclepiadeae)

Bullock: 612 (1956); Liede: 91 (1994).

Podostelma K.Schum.; *Microstephanus* N.E.Br.: 288 (1902/1903).

Perennials with procumbent or twining stems. **Leaves** opposite. **Flowers** small, in few-flowered umbel-like cymes, sublateral between bases of petioles. **Calyx** deeply 5-lobed; lobes small, oblong-ovate. **Corolla** campanulate; tube short; lobes lanceolate, overlapping and twisting to left in bud. **Corona** of 5 minute lobes or teeth alternating with anthers at their base. **Staminal column** arising a little above bottom of corolla tube; filamental part very short; anthers oblong, erect, strongly convex at back, with horny margins or wings forming gynostegial grooves, strongly incurved towards centre of flower; appendages suberect, membranous; pollinia pendulous, with very short caudicles. **Style** produced into a beak beyond anther appendages. **Follicles** lanceolate-acuminate, smooth. **Seeds** crowned with a tuft of hairs.

Species 2, E African coast from Somalia to Mozambique, Madagascar, and Aldabra islands; sthn trop. Afr. 1: *Pleurostelma cernuum* (Decne.) Bullock, Mozambique.

Raphionacme Harv.

(Periplocoideae)

Norman & Moore: 92 (1929); Bullock: 59 (1953a); Bullock: 353 (1953b); Binns: 21 (1968); Venter & Verhoeven: 72 (1988a); Venter & Verhoeven: 380 (1988b); Venter & Verhoeven: 705 (1997); Verhoeven & Venter: 46 (1997); Venter & Verhoeven: 169 (2000).

Chlorocyathus Oliv.: t. 1557 (1887). *Pentagonanthus* Bullock: t. 3583 (1962b); Bullock: 85 (1963); Bingham & Smith: 154 (2002).

Sthn trop. Afr. ± 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rauvolfia L.

(Rauvolfioideae—Vinceae)

Good: 86 (1929) as *Rauwolfia*; White: 350 (1962); Codd: 274 (1963); De Kruif: 458 (1985a); Van Dilst & Leeuwenberg: 21 (1991); White *et al.*: 142 (2001); Coates Palgrave: 957 (2002); Koch *et al.*: 83 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Riocreuxia Decne.

(Asclepiadoideae—Ceropegieae)

Binns: 21 (1968); Dyer: 83 (1980); Dyer: 227 (1983); White *et al.*: 163 (2001).

Ceropegia in sense of Huber: 167 (1957), in part.

Sthn trop. Afr. 2(3), Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Saba (Pichon) Pichon

(Rauvolfioideae—Willughbeieae)

Pichon: 302 (1953b); Kupicha: 427 (1985); Leeuwenberg & Van Dilst: 189 (1989); Endress & Bruyns: 35 (2000); White *et al.*: 144 (2001).

Tendrillous lianes climbing to 30 m; stem terete; slash pink; latex abundant in all parts; spines absent. **Leaves** elliptic or ovate, glabrous; petiolate; stipules absent. **Inflorescences** terminal, many-flowered paniculate cymes forming large dense heads, or lax and tendrillous. **Flowers** large, white, very sweetly scented. **Calyx**: lobes imbricate, free to base. **Corolla** hypocrateriform; tube cylindric, slightly enlarged at level of anthers, pilose within, especially towards mouth; lobes contorted, overlapping to the left, ± elliptic, shorter or longer than tube. **Stamens** inserted below middle of corolla tube; anthers subsessile, without carina. **Ovary** with a ring of stiff erect hairs at apex; style glabrous, clavuncle linear-fusiform, stigma not quite attaining level of anthers. **Fruit** a many-seeded glabrous berry with sclerified pericarp.

Species 3, African, one extending to Madagascar and the Comores; sthn trop. Afr. 1: *Saba comorensis* (Bojer) Pichon, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Sarcostemma R.Br.

(Asclepiadoideae—Asclepiadeae)

Bullock: 504 (1957); Liede & Meve: 223 (1992); Liede: 31 (1996d); Liede & Täuber: 133 (2000); Bruyns: 433 (2003); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Schizostephanus Hochst. ex Benth. & Hook.f.

(Asclepiadoideae—Asclepiadeae)

Liede: 92 (1994); Liede & Albers: 215 (1994).

Cynanchum, in part; Brown: 390 (1902/1903); Liede: 537 (1993).

Erect to scrambling perennials; shoots perennial, herbaceous to succulent, woody at base, glabrous. **Leaves** opposite, petiolate, with colleters at base; lamina glabrous, broadly ovate, base lobed, apex acute. **Inflorescence** botrychoid cymose, sometimes basally dichasial, 15–30-flowered; flowers small. **Sepals** fused at base; lobes ovate-acute, abaxially glabrous. **Corolla** rotate, 5-lobed nearly to base, adaxially with very long slender trichomes, abaxially glabrous; lobes oblong, obtuse, decurved. **Corona** tubular, terminating in 10 teeth, longer than gynostegium; staminal and interstaminal corona equally long but largely fused. **Gynostegium** borne on a long slender stipe. **Anthers** trapezoid; anther wings vaguely differentiated, basally widening; pollinia clavate, attached along a dorsal rim. **Follicles** ellipsoid, smooth, glabrous. **Seeds** pyriform, with entire marginal wing and a tuft of hairs.

Sthn trop. Afr. 2, Angola, Zimbabwe, and sthn Afr. Endress & Bruyns (2000) do not list this genus. They presumably consider it a synonym of *Cynanchum*.

Schizozygia Baill.

(Rauvolfioideae—Tabernaemontaneae)

Baillon: 752 (1888); Barink: 447 (1985); White *et al.*: 144 (2001).

Shrubs or small trees, repeatedly dichotomously branched and with 2 inflorescences in each fork; with white latex; branchlets terete. **Leaves** opposite, those of a pair equal, petiolate, with 1 or 2 rows of colleters in axils; lamina obovate, cuneate at base. **Inflorescences** corymbose, congested. **Flowers** regular except for the sometimes slightly unequal sepals. **Calyx** green; sepals free, subequal, entire. **Corolla** with tube yellow and limb creamy to yellow; tube slightly shorter to much longer than calyx; lobes in bud overlapping to the right, spreading. **Stamens** included or nearly so; anthers sessile, narrowly triangular, acute at apex, sagittate at base, glabrous or sometimes papillose, introrse, with upper $^2/_3$ fertile. **Ovary** glabrous or nearly so, subglobose, composed of 2 free carpels; disc adnate to ovary for ± $^7/_{10}$ of its height; clavuncula cylindric; stigma minute, 2-lobed. **Fruit** composed of 2 almost free adaxially dehiscent carpels, wall thinly coriaceous, irregularly striate, grooved when dry. **Seeds** few, surrounded by a thin red or orange pulpy aril, obliquely ellipsoid, with a deep groove to $^1/_2$ their width at hilar side and shallowly grooved at other sides, minutely rugose; endosperm copious, starchy, white, ruminate, surrounding spathulate embryo.

Monotypic: *Schizozygia coffaeoides* Baill., Africa; sthn trop. Afr.: Angola, Malawi.

Schlechterella K.Schum.

(Periplocoideae)

Schumann: 462 (1899); Venter & Verhoeven: 350 (1998); Venter & Verhoeven: 564 (2001).

Climbers with white latex; roots tuberous; stems subterranean and aerial: subterranean stems perennial, sprouting from top of root tuber; aerial stems annual or perennial, twining, with interpetiolar, purplish maroon, acicular colleters. **Leaves** opposite or fascicled, sessile to petiolate, simple; blade linear to narrowly obovate, entire, sometimes undulate. **Inflorescences** axillary and terminal, cymose with monochasial branches; bracteate. **Flowers** regular, bisexual, pentamerous; gynostegium exserted from corolla mouth. **Sepals** free, narrowly triangular or narrowly ovate, with paired colleters at their inner bases. **Corolla** glabrous; tube campanulate; lobes linear to very narrowly ovate or obovate. **Corona** corolline, double; outer corona at mouth of corolla tube, 5 lobes basally fused into an annular tube, lobes antesepalous, with segmented apices; inner corona of 5 free interstaminal discs. **Stamens** 5, epipetalous, directly below outer corona lobes, free, glabrous;

filaments filiform; anthers basally fused to stigmatic head and conniving in a cone above it, glabrous, connective apically short, acute, pollinia subreniform. **Ovaries** 2, half-inferior, many-ovuled; styles basally free, apically fused; stigmatic head broadly pentagonal-deltoid with obtuse apex; pollen translators with receptacle oblong-ovate to oblong-elliptic, folded scoop-shaped, stipe terete, adhesive disc subcircular. **Follicles** paired, horizontally divergent, very narrowly ovoid with acuminate apex.

Species 2, eastern Africa from Ethiopia to Mozambique; sthn trop. Afr. 1: *Schlechterella africana* (Schltr.) K.Schum., Mozambique.

Secamone R.Br.

(Secamonoideae)

Bullock: 362 (1953b); Bullock: 368 (1954); Binns: 22 (1968); Goyder: 437 (1992); Klackenberg: 317 (2001); White *et al.*: 165 (2001).

Toxocarpus Wight & Arn., in part; Brown: 286 (1902/1903); Norman & Moore: 93 (1929); Bullock: 193 (1961); Bullock: 88 (1963).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sisyranthus E.Mey.

(Asclepiadoideae—Ceropegieae)

Weimarck: 402 (1935); Mapaura (Unpublished).

Sthn trop. Afr. 1: *Sisyranthus rhodesicus* Weim., Zimbabwe, and sthn Afr.

Sphaerocodon Benth.

(Asclepiadoideae—Asclepiadeae)

Brown: 773 (1907–1909); Norman & Moore: 97 (1929); Weimarck: 401 (1935); Binns: 22 (1968).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Stapelia L.

(Asclepiadoideae—Ceropegieae)

Binns: 22 (1968); Kers: 173 (1969); Leach: 1 (1985); Kimberley: 62 (1986); De Kock: 8 (2001b).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stathmostelma K.Schum.

(Asclepiadoideae—Asclepiadeae)

Bullock: 51 (1953a); Bullock: 342 (1953b); Bullock: 195 (1961); Goyder: 577 (1998b).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stenostelma Schltr.

(Asclepiadoideae—Asclepiadeae)

Bullock: 417 (1952); Bullock: 342 (1953b).

Sthn trop. Afr. 1: *Stenostelma eminens* (Harv.) Bullock, Zimbabwe, and sthn Afr.

Stomatostemma N.E.Br.

(Periplocoideae)

Venter & Verhoeven: 50 (1993).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Strophanthus DC.

(Apocynoideae—Wrightieae)

Beentje: (1982); Beentje: 468 (1985); White *et al.*: 146 (2001); Bingham & Smith: 140 (2002); Coates Palgrave: 962 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tabernaemontana L.

(Rauvolfioideae—Tabernaemontaneae)

Leeuwenberg: 383 (1978); Leeuwenberg: 438 (1985a); Leeuwenberg: 1 (1991); White *et al.*: 146 (2001); Coates Palgrave: 952 (2002).

Conopharyngia G.Don; Burtt Davy *et al.*: 26 (1958). *Gabunia* K.Schum. ex Stapf; Good: 87 (1929).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tabernanthe Baill.

(Rauvolfioideae—Tabernaemontaneae)

Stapf: 122 (1902); Norman & Moore: 86 (1929); Hürlimann: 487 (1957); Bullock: 395 (1962a).

Daturicarpa Stapf: 166 (1921); Hürlimann: 487 (1957).

Shrubs or small trees, dichotomously branched, with milky latex. **Leaves** opposite, herbaceous, broadly elliptic to elliptic-oblong, acuminate; stipules absent, but filiform colleters often many. **Flowers** small, in terminal or pseudo-axillary, subcorymbose or umbelliform, minutely bracteate inflorescences. **Calyx** deeply 5-partite; sepals rotundate-ovate, acute, the inner with 1 or 2 glands at base, persistent and reflexed in fruit. **Corolla**: tube subcylindric; lobes obliquely subrotundate. **Stamens** arising at middle of tube; filaments very short, stout; anthers conniving in a cone, with acute tails. **Disc** absent. **Ovary** syncarpous, imperfectly 2-celled; style filiform; stigma capitate, 5-grooved, with a 2-fid slender apiculus. **Fruit** baccate, fleshy, ovoid, acuminate. **Seeds** few, ellipsoid, embedded in scanty pulp.

Species 2, central trop. Africa; sthn trop. Afr. 1: *Tabernanthe iboga* Baill., Angola.

Tacazzea Decne.

(Periplocoideae)

Bullock: 350 (1954); Venter *et al.*: 93 (1990); Venter & Verhoeven: 566 (2001); White *et al.*: 165 (2001).

Zacateza Bullock: 361 (1954).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tavaresia Welw.

(Asclepiadoideae—Ceropegieae)

Leach: 349 (1974); Kimberley: 62 (1986); Jonkers: 15 (1999); Van Jaarsveld & Nagel: 9 (1999); De Kock: 9 (2001b); Mapaura & Timberlake: 162 (2002).

Decabelone Decne.; Bullock: 508 (1961).
Sthn trop. Afr. 3, Angola, Zimbabwe, and sthn Afr.

Telosma Coville

(Asclepiadoideae—Marsdenieae)
Brown: 775 (1907–1909); Bullock: 97 (1963); Liede: 63 (1990).

Pergularia in the sense of R.Br., in part; Brown: 426 (1903); Binns: 21 (1968).

Sthn trop. Afr. 1: *Telosma africanum* (N.E.Br.) Coville, Zimbabwe, Malawi, and sthn Afr.

Trachycalymma (K.Schum.) Bullock

(Asclepiadoideae—Asclepiadeae)
Bullock: 348 (1953b); Bullock: 620 (1956); Binns: 22 (1968) as *Trachycalymna*; Goyder: 129 (2001).

Perennial herbs with annual stems arising from tuberous rootstocks; stems usually single, erect, mostly unbranched, densely pubescent with spreading white hairs; latex milky. **Leaves** opposite, sessile or petiolate; lamina linear to lanceolate, oblong or ovate, pubescent or subglabrous, margins pubescent. **Inflorescences** extra-axillary, pedunculate, umbellate; flowers mostly nodding. **Calyx** lobed to base. **Corolla** campanulate, or occasionally reflexed. **Corona**: staminal corona lobes diverse, but always arising from base of staminal column and adnate to it by their entire length, weakly to strongly cucullate, frequently somewhat pouched, with or without a laterally flattened tooth within cavity of lobe. **Anther**: appendages inflexed over apex of stigma head. **Pollinaria** with flattened and geniculate translator arms, mostly with a clasping overlap to the pollinia; pollinia flattened, obovate to obtriangular. **Follicles** erect, narrowly fusiform to ovoid, not inflated, densely pubescent, at least when young; fruiting pedicel contorted or not. **Seeds** flattened or somewhat convex, ovate, comose.

Species 10, trop. Africa; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Tylophora R.Br.

(Asclepiadoideae—Asclepiadeae)
Bullock: 579 (1955a); Bullock: 624 (1956); White: 360 (1962); Liede: 193 (1996b); White *et al.*: 166 (2001).

Tylophoropsis N.E.Br.; Liede: 93 (1994).

Sthn trop. Afr. 4, Angola, Zambia, Malawi, Mozambique, and sthn Afr.

Vahadenia Stapf

(Rauvolfioideae—Willughbeieae)
Haegens: 320 (1994); Endress & Bruyns: 35 (2000).

Lianas up to 30 m high climbing in trees; white latex present in all parts; branches with many lenticels. **Leaves** opposite, petiolate, entirely glabrous, obovate to elliptic. **Inflorescences** lax cymes, axillary or terminal, few- to many-flowered. **Flowers** 5-merous, white, reddish at base, sweet-scented. **Calyx** green, ciliate, otherwise glabrous, with many colleters in several rows at base. **Corolla** glabrous except for a tuft of hairs inside at base of lobes; tube almost cylindric, 1.5–4.1 times as long as sepals; lobes as long as to longer than tube, narrowly obovate, with 1 longitudinal groove outside. **Stamens** arising ± in middle of corolla tube; filaments glabrous, white; anthers narrowly ovate to cordate. **Ovary** cylindric, abruptly narrowing into style, pubescent in upper half, style glabrous, style head conical from a thickened base, minutely 2-lobed at level of anthers. **Fruit** syncarpous, globose, pear-shaped or obovoid; pulp orange. **Seeds** 10–40, ellipsoid, laterally compressed; testa thin; endosperm thick, white; cotyledons ellipsoid, undulate; embryo very small.

Species 2, trop. Africa; sthn trop. Afr. 1: *Vahadenia laurentii* (De Wild.) Stapf, Angola.

Voacanga Thouars

(Rauvolfioideae—Tabernaemontaneae)
White: 352 (1962); Leeuwenberg: 434 (1985a); Leeuwenberg: 5 (1985c); Leeuwenberg: 1011 (1987); Endress & Bruyns: 35 (2000); White *et al.*: 148 (2001); Coates Palgrave: 955 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Wrightia R.Br.

(Apocynoideae—Wrightieae)
Leeuwenberg: 480 (1985a); White *et al.*: 150 (2001); Coates Palgrave: 964 (2002).

Sthn trop. Afr. 1: *Wrightia natalensis* Stapf, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Xysmalobium R.Br.

(Asclepiadoideae—Asclepiadeae)
Brown: 298 (1902/1903); Norman & Moore: 94 (1929); Bullock: 413 (1952); Bullock: 353 (1953b); Binns: 23 (1968).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Aquifoliaceae
(Asteridae—Aquifoliales)
(Euasterids II—Aquifoliales)

Archer, R.H. in Leistner: 98 (2000).

Sthn trop. Afr.: genus 1, species 1.

Ilex L.

Exell & Mendonça: 348 (1951); Mendes: 353 (1966); Mendes: 1 (1973); White *et al.*: 150 (2001); Coates Palgrave: 587 (2002).

Sthn trop. Afr. 1: *Ilex mitis* (L.) Radlk. var. *mitis*: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Araliaceae
(Rosidae—Apiales)
(Euastrids II—Apiales)

Bredenkamp, C.L. in Leistner: 99 (2000).

Sthn trop. Afr.: genera 5, species 25.

Identification of additional genus using the key in the above reference: Polyscias will run to 1b but differs from all other genera beyond that couplet in having pinnately compound leaves.

Centella L.

Norman: 198 (1929) under Apiaceae (Umbelliferae); Cannon: 339(1970); Cannon: 561 (1978); Cannon & Martins: 7 (1981b) under Apiaceae (Umbelliferae); Izidine & Bandeira: 49 (2002) under Apiaceae.

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cussonia Thunb.

Cannon: 362 (1970); Bamps: 102 (1974a); Bamps: 6 (1974b); Cannon: 628 (1978); Cannon & Martins: 9 (1981a); White *et al.*: 152 (2001); Coates Palgrave: 846 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hydrocotyle L.

Cannon: 336 (1970); Cannon: 557 (1978); Cannon & Martins: 4 (1981b) all under Apiaceae (Umbelliferae).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Polyscias J.R.Forst. & G.Forst.

Norman: 236 (1933); Cannon: 361 (1970); Bamps: 120 (1974a); Bamps: 2 (1974b); Cannon: 625 (1978); Cannon & Martins: 5 (1981a); Plunkett *et al.*: 213 (2001); White *et al.*: 154 (2001); Coates Palgrave: 845 (2002).

Trees, often tall and with noticeably regular branching. **Leaves** petiolate, pinnately compound, glabrous to densely tomentose with stellate or simple hairs; leaflets simple, ± entire. **Inflorescence** paniculate, regularly compound, racemosely branched with ultimate divisions of racemules or umbellules. **Calyx** forming a shallow cup, subentire or shallowly 5-toothed. **Petals** 5. **Stamens** 5. **Ovary** 2-locular; styles 2 (or 5), divergent for nearly their entire length; stylopodium not well-developed. **Fruit** terete or slightly compressed. **Seeds** rounded or laterally compressed, ellipsoid, smooth or sometimes ribbed; endosperm not ruminate.

Sthn trop Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Schefflera J.R.Forst. & G.Forst.

Cannon: 361 (1970); Bamps: 126 (1974a); Bamps: 16 (1974b); Cannon: 622 (1978); Cannon & Martins: 2 (1981a); White *et al.*: 154 (2001); Bingham & Smith: 140 (2002); Coates Palgrave: 845 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Aristolochiaceae

(Magnoliidae—Aristolochiales)
(Magnoliids—Aristolochiales)

Jordaan, M. in Leistner: 100 (2000).

Sthn trop. Afr.: genera 2, species 5.

Key to genera

[partly after Verdcourt (1986)]

Fruit dehiscent, short; stigmatic lobes up to 6; anthers up to 6; flowers borne on leafy shoots ..... **Aristolochia**
Fruit indehiscent, elongate, strongly ribbed; stigmatic lobes 6–12; anthers 6–24; flowers mostly on the old wood ..... **Pararistolochia**

Aristolochia L.

White: 44 (1962); Binns: 19 (1968); Stannard: 19 (1997); González: 159 (1999); White *et al.*: 158 (2001).

Sthn trop. Afr. 4, including the introduced **Aristolochia elegans* Mast., which is widely cultivated and naturalised in many places, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and introduced in sthn Afr.

Pararistolochia Hutch. & Dalziel

Hutchinson & Dalziel: 75 (1927); Poncy: 466 (1977); Poncy: 916 (1984); Verdcourt: 1 (1986); Huber: 135 (1993); Stannard: 19 (1997).

Climbing woody shrubs; stems mostly little-branched, older stems bilobed in transverse section. **Leaves** ± undulate or 3-lobed, mostly deeply cordate at base, glabrous, long-petiolate; pseudostipules absent. **Flowers** mostly borne on old wood in clusters of (1)2 or 3; without foliaceous prophyll; with odour of carrion. **Perianth** obliquely tubular, base inflated-globose, pouched; throat of tube with downwardly projecting ivory-white or violet hairs; lobes 3, equal, triangular-lanceolate, horizontally spreading. **Gynostemium**: lobes and anthers 9. **Ovary** 6-locular; ovules many. **Fruit** woody, cucumber-like, indehiscent, strongly 6-ribbed, straight or curved. **Seeds** ± 100 per locule, triangular, flattened, arranged in line in each locule.

Species ± 18, Old World tropics, 9 in trop. Africa; sthn trop. Afr. 1: *Pararistolochia triactina* (Hook.f.) Hutch. & Dalziel, Angola.

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Asteraceae
(Compositae)
(Asteridae—Asterales)
(Euasterids II—Asterales)

Herman, P.P.J., Retief, E., Koekemoer, M. & Welman,W.G. in Leistner: 101 (2000).

Sthn trop. Afr.: genera 147, species 844.

Key to tribes

1a Corollas all strap-shaped, equally 5-toothed at apex; latex present ..... **Cichorieae** (p.83)
1b Corollas not strap-shaped, OR if some or all strap-shaped, than these with 3(4) or fewer apical teeth:
2a Involucral bracts in 1 row, cohering by their overlapping margins, or partly or wholly connate; with or without a calyculus of small, often black-tipped, external bracts; pappus present:
3a Involucral bracts with evident elongated oil glands; mature cypselas black ..... **Heliantheae** (p. 85)
3b Involucral bracts without elongated oil glands; cypselas not black ..... **Senecioneae** (p. 88)
2b Involucral bracts imbricate, in 2 or more rows, free or connate; OR if in one row then pappus absent, or capitula unisexual or cypselas densely villous with long hairs:
4a Style branches with conspicuous, ± clavate papillose appendages; capitula discoid, with all flowers bisexual, not yellow; corollas with 5(4) relatively short, broad apical teeth; mature cypselas black ..... **Eupatorieae** (p. 84)
4b Style branches, capitula, corolla and cypselas not showing the above combination of characters:
5a Capitula homogamous, all florets tubular and bisexual, OR if capitula unisexual, then plants dioecious:
6a Leaves spiny:
7a Anthers tailed; receptacle densely setose ..... **Cardueae** (p. 83)
7b Anthers not tailed; receptacle honeycombed with fringed pits ..... **Arctotideae** (p. 84)
6b Leaves not spiny:
8a Anthers not tailed; styles shortly hairy on upper part of shaft and on outside of the long acute style branches ..... **Vernonieae** (p. 83)
8b Anthers tailed or capitula unisexual; styles not as above:
9a Receptacle densely setose; florets all tubular ..... **Cardueae** (p. 83)
9b Receptacle not setose but naked or scaly; florets all tubular or the outer ones or all bilabiate ..... **Mutisieae** (below)
5b Capitula heterogamous, OR if homogamous, then florets with 5, 4 or 3 relatively short and wide lobes, OR involucral bracts with appendages or margins which are thin and dry and often brownish, OR if capitula unisexual then plants monoecious:
10a Style branches of bisexual disc florets connate nearly to the tips, with upper part of style shaft abruptly or gradually thickened below them; involucral bracts, if connate in lower part, in several rows; capitula always bisexual ..... **Arctotideae** (p. 84)
10b Style branches of disc florets long to short or absent but upper part of style shaft not thickened as above, or capitula unisexual and monoecious; involucral bracts, if connate, in 1 row:
11a Receptacle scaly, OR if not scaly then pappus of scales, and/or leaves opposite, and/or cypselas black, and/or capitula unisexual ..... **Heliantheae** (p. 85)
11b Receptacle not scaly OR if so, then leaves not opposite, cypselas not black and capitula not unisexual:
12a Style branches with a subulate to triangular appendage ..... **Astereae** (p. 86)
12b Style branches without a subulate to triangular appendage, acute to rounded, or truncate and fringed with short hairs or papillae:
13a Involucral bracts with thin, dry, usually brown, often erose margins; style branches truncate and fringed; pappus of hairs absent ..... **Anthemideae** (p. 84)
13b Involucral bracts green and herbaceous or with almost transparent margins or with thin, dry, membranous appendages; pappus of hairs present, OR if absent, then style branches not truncate and fringed, or involucral bracts in 1 row:
14a Pappus present; anthers tailed, sometimes minutely so ..... **Inuleae** (including **Gnaphalieae** and **Plucheeae**) (p. 87)
14b Pappus absent; anthers not tailed:
15a Fruits large, curved or angular or winged cypselas or smooth drupes ..... **Calenduleae** (p. 84)
15b Fruits small columnar cypselas ..... **Senecioneae** (p. 88)

Tribe **Mutisieae**

Key to genera

1a Plants dioecious; shrubs or trees:
2a Pappus of scabrid bristles ..... **Brachylaena**
2b Pappus 0 ..... **Tarchonanthus**
1b Plants monoecious; suffrutices with annual stems from woody rootstocks, or annual herbs:
3a Scales present on receptacle, resembling the inner involucral bracts ..... **Erythrocephalum**
3b Scales on receptacle 0:
4a Plants acaulescent but possessing a scape (*Dicoma plantaginifolia* sometimes apparently acaulescent but never possessing a scape) ..... **Gerbera**
4b Plants caulescent, not scapigerous; stems occasionally much abbreviated with capitula borne at ground level:
5a Capitulum radiate; ray florets neuter with strap-shaped, ± oblanceolate, erect limb; pappus of narrow scales ..... **Passacordoa**

5b Capitulum discoid or disciform; outer florets sometimes filiform, neuter and/or bilabiate but not strap-shaped; pappus of barbellate or plumose setae:
6a Apices of involucral bracts rounded or narrowly obtuse; corolla limb well exserted above pappus and involucre; leaves usually stem-sheathing at the base ..... **Pleiotaxis**
6b Apices of involucral bracts tapering-pungent; corolla hardly visible above the pappus; leaves not stem-sheathing at the base, or if so then innermost involucral bracts shorter and broader than outer ones ..... **Dicoma**

Tribe **Cardueae**

Key to genera

1a Leaves and stem-wings, if present, not spinescent at the margins; outer involucral bracts with a distinct apical appendage spinose on the margins; pappus of scale-like setae free to the base; capitula heterogamous, radiate; plants not thistle-like ..... **Centaurea**
1b Leaves and stem-wings spinescent at the margins; outer involucral bracts without obvious apical appendages, apices ± spinescent, sometimes pectinate-spinescent or lacerate on the margins about the apex; pappus setae connate at the base into a ring; capitula homogamous; plants thistle-like:
2a Pappus setae feathery; margins of outer involucral bracts pectinate-spinescent ..... **Cirsium**
2b Pappus setae not feathery; margins of involucral bracts entire ..... **Carduus**

Tribe **Vernonieae**

Key to genera

1a Capitula aggregated in many secondary capitula surrounded by bracts; involucral bracts ± 8, decussate ..... **Elephantopus**
1b Capitula free or in clusters, but without bracts surrounding the clusters; involucral bracts more than 8, imbricate:
2a Pappus in 1 whorl of few free bristles or scales, or ± fused into a tubular to cup-shaped structure, or a short rim, or an undulate to denticulate corona, or pappus absent:
3a Leaves pinnatisect; cypselas 4-angled, pappus 0 ..... **Rastrophyllum**
3b Leaves entire, serrate or dentate:
4a Hairs on stem T-shaped, with short stalk and two long equal arms ..... **Gutenbergia**
4b Hairs on stem simple or asymmetrically T-shaped (one short and one long arm):
5a Receptacle with scales between the florets; pappus tubular to cup-shaped, or a short denticulate corona:
6a Pappus a membranous tubular cupule; cypsela subcylindric ..... **Gossweilera**
6b Pappus a short denticulate corona; cypsela 5-angled ..... **Omphalopappus**
5b Receptacle without scales between the florets; pappus various:
7a Pappus of 4–8 scales ..... **Ageratinastrum**
7b Pappus a short rim or corona, or of bristles, or absent:
8a Pappus absent or a short rim or corona:
9a Pappus absent or represented by a short apical rim; cypselas ± turbinate, (3–)5(6)-ribbed ..... **Ethulia**
9b Pappus a short undulate corona; cypselas obovoid, ± 10-ribbed ..... **Muschleria**
8b Pappus of few bristles:
10a Cypselas with glands in sunken pits; pappus of few coarsely barbellate bristles; corolla lobes hairy ..... **Erlangea**
10b Cypselas with raised glands, or glands only in grooves, or absent; corolla lobes mostly glabrous ..... **Bothriocline**
2b Pappus in 2 or more whorls, the inner whorl composed of setae, the outer whorl of setae or scales or reduced to a low ring of free or ± united brief scales:
11a Inner pappus copious, with many bristles:
12a Corolla orange-yellow ..... **Distephanus**
12b Corolla purple, mauve, blue, green or white ..... **Vernonia**
11b Inner pappus of few bristles or scales:
13a Receptacle with scales between the florets/cypselas ..... **Dewildemania**
13b Receptacle without scales:
14a Pappus of 4–7 broad, ± united scales alternating with 4–7 paleaceous setae ..... **Ageratinastrum**
14b Pappus of small scales and larger bristles:
15a Inner pappus bristles longer than 3 mm or if shorter, then plant with T-shaped hairs; outer pappus of scales ..... **Vernonia**
15b Inner pappus bristles 1.5–2.5 mm long, or if longer, then outer pappus a rim ..... **Brachythrix**

Tribe **Cichorieae** (Lactuceae)

Key to genera

1a Pappus of a small rim of scales up to 2 mm long; stalks of individual capitula widened just below the capitulum ..... ***Cichorium**
1b Pappus of hairs or bristles at least 4 mm long; stalks of individual capitula not widened:
2a Pappus hairs (at least the inner ones) plumose ..... ***Hypochaeris**
2b Pappus hairs at most barbellate:
3a Cypselas distally tuberculate, with long, slender beak; scape with a single capitulum, the stalk hollow ..... ***Taraxacum**
3b Plants not scapose, or cypselas and scapes not as above:
4a Cypselas beaked or attenuate distally, with ascending hairs or projections on the ribs or margins:
5a Cypselas ± compressed, abruptly constricted; involucral bracts without setae (except in *Lactuca glandulifera*); flowers yellow, blue, purple or white ..... **Lactuca**

5b Cypselas terete, gradually tapering; involucral bracts setose; flowers yellow only ..... **Crepis**
4b Cypselas truncate, without ascending hairs or projections (but occasionally slightly beaked with muricate ribs in *Launaea*):
6a Flowers pink or purple; leaves ± peltate ..... **Prenanthes**
6b Flowers yellow; leaves sessile, or with petiole proximally:
7a Cypselas compressed; involucral bracts usually pale tomentose at base ..... **Sonchus**
7b Cypselas columnar; involucral bracts glabrous or hairy, but not tomentose proximally:
8a Involucral bracts glabrous or with a minute tuft of hairs at the apex (*Launaea cornuta* with a single seta near the apex) ..... **Launaea**
8b Involucral bracts hairy or setose:
9a Cypselas 2.0–3.5 mm long, obconic, truncate above, pappus of comparatively few coarse scabrid bristles; involucral bracts 6–10 mm long, glandular, pubescent to tomentose ..... **Tolpis**
9b Cypselas and pappus not as above; involucral bracts 6–17 mm long, setose, sometimes also pubescent or glandular:
10a Leaves with attenuate base; mature cypselas 6–10 mm long ..... **Crepis newii**
10b Leaves sessile, with large basal auricles; mature cypselas 2.5–4 mm long ..... **Sonchus oleraceus**

Tribe **Arctotideae**

Key to genera

1a Involucral bracts ± free, apices obtuse (at least in inner bracts), scarious at the tips and on the margins:
2a Cypselas with 2 linear grooves or longitudinal chambers on one face; alveolae on receptacle setose ..... **Arctotis**
2b Cypselas obscurely longitudinally ribbed, not developing longitudinal chambers on one face; alveolae on receptacle ± fimbriate, not long-setose:
3a Cypselas glabrous or pubescent with a basal tuft of short or long upward-pointing hairs; ray florets female; pappus of overlapping scales ..... **Haplocarpha**
3b Cypselas densely woolly, without a basal coma of hairs; ray florets neuter; ovary rudimentary; pappus ± fused, coroniform ..... **Arctotheca**
1b Involucral bracts connate at the base or higher, apices acute or acuminate, often spine-tipped:
4a Involucral bracts connate at the base only, always spiny ..... **Berkheya**
4b Involucral bracts connate to higher up forming a cup-shaped involucrum, mostly bristly, hardly spiny:
5a Pappus in 1 whorl or in 2 whorls and dimorphic, the outer whorl of overlapping sessile scales, the inner whorl of much smaller stipitate scales; plants ± bristly-setose or glabrescent, rarely glandular-hairy ..... **Hirpicium**
5b Pappus in 2 whorls of subequal slender accrescent scales, scales of outer whorl not overlapping, scales of inner whorl ± similar in length and shape to the outer but with a short stalk; plants ± araneose or glabrous, not hispid ..... **Gazania**

Tribe **Eupatorieae**

Key to genera

1a Anthers truncate at the apex or minutely apiculate; pappus of 3 or 5 gland-tipped processes ..... **Adenostemma**
1b Anthers with an apical appendage; pappus of eglandular bristles or scales:
2a Pappus of scales, sometimes accompanied by bristles ..... ***Ageratum**
2b Pappus of bristles:
3a Involucral bracts 4 or 5; plant a twiner or scrambler ..... **Mikania**
3b Involucral bracts many, if few then plant erect, not twining:
4a Involucral bracts with coloured tips, deciduous; pappus of many capillary bristles ..... ***Chromolaena**
4b Involucral bracts and pappus not as above; cypselas 5- to 8-ribbed, with many small bristles ..... **Stomatanthes**

Tribe **Anthemideae**

Key to genera

1a Ray florets present:
2a Pappus 0; ray florets female ..... **Phymaspermum**
2b Pappus of 1 whorl of rounded scales; ray florets sterile ..... **Ursinia**
1b Ray florets 0:
3a Corolla of bisexual flowers 4-lobed:
4a Capitula solitary ..... **Cotula**
4b Capitula in corymbiform or subglobose groups ..... **Schistostephium**
3b Corolla of bisexual flowers 5-lobed:
5a Pappus of small scales; anthers distinctly tailed; plant not markedly aromatic ..... **Inulanthera**
5b Pappus 0; anthers not tailed; plants very aromatic ..... **Artemisia**

Tribe **Calenduleae**

Key to genera

1a Shrubs; involucral bracts in 2 or 3 rows; fruit a fleshy drupe ..... **Chrysanthemoides**
1b Herbs or subshrubs; involucral bracts in 1(2) rows; fruit a cypsela:
2a Disc florets functionally male ..... **Osteospermum**
2b Disc florets mostly bisexual; disc cypselas laterally flattened with thickened margins ..... **Dimorphotheca**

Tribe **Heliantheae** (including Helenieae)

Key to genera

1a Plants monoecious: capitula unisexual:
2a Involucral bracts of male capitula connate; female capitula 1-flowered; cypsela clasped by female involucre which bears 4–6 spines .... ***Ambrosia**
2b Involucral bracts of male capitula free; female capitula 2-flowered; cypselas clasped by female involucre bearing many hooked spines ***Xanthium**
1b Plants dioecious; capitula bisexual:
3a Receptacle without paleae:
4a Perennial herbs with somewhat fleshy roots; ray florets 0, or present and eligulate; involucral bracts many in 3–5 series; involucre more than 5 mm in diameter:
5a Leaves alternate; pappus of toothed scales; corolla yellow ..... **Welwitschiella**
5b Leaves opposite; pappus of ± fimbriately winged setae, usually terminating in a hooked point; corolla orange ..... **Hypericophyllum**
4b Annual herbs, introduced weeds; ray florets 1–many, ligulate; involucral bracts few in 1–3 series; involucre usually less than 5 mm in diameter (up to 25 mm in *Tagetes patula*):
6a Leaves simple, all opposite; pappus 0; capitula sessile or very shortly pedicelled ..... ***Flaveria**
6b Leaves mostly pinnatisect, opposite or alternate; pappus present; capitula distinctly stalked:
7a Plants strongly aromatic when bruised; leaf lobes narrowly elliptic or lanceolate, margins serrate; involucral bracts united along their margins ..... ***Tagetes**
7b Plants not strongly aromatic; leaf lobes filiform, margins entire; involucral bracts free ..... ***Schkuhria**
3b Receptacle with paleae:
8a Inner florets of disc functionally male:
9a Leaves opposite; cypselas tightly clasped by one of the inner involucral bracts with hooked spines; pappus 0 ..... ***Acanthospermum**
9b Leaves alternate; cypselas clasped by an unarmed involucral bract and 2 paleae, or not clasped but paleae on receptacle strongly conduplicate; pappus of 2–4 stout awns:
10a Cypselas clasped by an involucral scale and 2 lateral, concave, involucral paleae; pappus of 2 recurved awns clasping the margin of the cypsela ..... ***Parthenium**
10b Cypselas often clasped or enfolded by the strongly conduplicate paleae on the receptacle; pappus of (2–)4 stout setae .. **Blepharispermum**
8b Inner florets of disc bisexual, fertile (if numerous florets present then innermost ones sometimes sterile):
11a Paleae on receptacle ± flat, not clasping the cypselas:
12a Involucral bracts quite free, the inner merging gradually into the receptacular paleae; leaves simple:
13a Pappus 0; lamina of ray florets golden yellow ..... ***Guizotia**
13b Pappus present; lamina of ray florets white, cream or yellow:
14a Pappus of 2 awns or of many bristles; ray florets female, strap-shaped or ± bilabiate, yellow or creamy:
15a Pappus of many densely plumose bristles; cypselas not winged ..... ***Tridax**
15b Pappus of 2 awns connate to the deeply lobate wings of the cypsela ..... ***Synedrella**
14b Pappus of several scales; rays very small, white ..... ***Galinsoga**
12b Involucral bracts of the inner row connate at the base, outer row with fewer and mostly smaller or narrower bracts; leaves variously divided:
16a Leaves alternate ..... ***Chrysanthellum**
16b Leaves opposite:
17a Ray florets yellow, golden, orange or 0 ..... **Bidens**
17b Ray florets white, pink, lilac or red ..... ***Cosmos**
11b Paleae on receptacle ± conduplicate and clasping or ± enfolding cypselas:
18a Involucral bracts 4, in 2 rows of opposite pairs, leafy; flower heads axillary, sessile or subsessile ..... **Enydra**
18b Involucral bracts 3 to many, but not in 2 rows of opposite pairs and leafy; capitula not sessile or subsessile and axillary:
19a Inner involucral bracts embracing fertile ray cypselas; involucral bracts spathulate and densely glandular ..... ***Sigesbeckia**
19b Inner involucral bracts not embracing outermost cypselas:
20a Leaves usually alternate; paleae of receptacle boat-shaped to slightly conduplicate:
21a Paleae clasping the cypselas produced above into a ± tubular neck; ray florets 0 or sterile ..... **Sclerocarpus**
21b Paleae of receptacle slightly conduplicate, if partly enfolding cypselas, then not produced into a tubular neck ..... **Athroisma**
20b Leaves opposite, sometimes alternate above:
22a Cypselas surmounted by a distinct, often lacerate cupule; additional pappus bristles present or not:
23a Ray florets sterile (although style and stigmas rarely present); all cypselas ± alike, bilaterally convex or obscurely 4-angled ..... **Aspilia**
23b Ray florets fertile (with style and stigmas, and producing mature cypselas); outer cypselas ± triquetrous; lamina small, white ..... **Blainvillea**
22b Cypselas without pappus, or with pappus of various kinds, but not a cupule:
24a Ray florets persistent; unbranched annual herbs up to 0.6 m high; leaves narrowly oblong-ovate ..... ***Zinnia**
24b Ray florets not persistent:
25a Cypselas 4-sided; capitula large and showy with orange-red or yellow ray florets; apex of peduncles becoming very thick ..... ***Tithonia**
25b Cypselas ± compressed or, if not noticeably compressed, peduncles not swollen above:

26a Paleae of receptacle obovate, truncate-emarginate and caudate-spinescent at apex; perennial shrubs up to 6 m tall with white rays ..... ***Montanoa**
26b Paleae of receptacle not caudate-spinescent:
27a Disc florets deep purple, at least above ..... **Helianthus**
27b Disc florets not purple:
28a Disc florets white; paleae of receptacle very narrow and often setiform ..... ***Eclipta**
28b Disc florets not white, ± yellowish to orange:
29a Cypselas thick or angular, not compressed, pubescent at apex, not winged or margined ..... **Melanthera**
29b Cypselas ± compressed, winged or with a hyaline cartilaginous margin:
30a Receptacle flat; cypselas with broad, irregular margin; lamina of ray florets 10 mm long or more ..... ***Verbesina**
30b Receptacle convex to narrowly conical; cypselas with hyaline, cartilaginous margin; capitula radiate or discoid:
31a Capitula discoid; pappus of 2 or 3 rigid bristles ..... **Spilanthes**
31b Capitula radiate; pappus 0 ..... **Acmella**

Tribe **Astereae**

Key to genera

1a Pappus in 1 series or rudimentary to 0:
2a Capitula distinctly radiate:
3a Pappus of minute scales or a minute annular rim:
4a Receptacle dome-like; leaves alternate, pinnatifid ..... **Gyrodoma**
4b Receptacle flat; leaves alternate or opposite, linear ..... **Jeffreya**
3b Pappus of scabrid or barbellate bristles:
5a Scandent or twining shrubs ..... **Microglossa**
5b Herbs or shrubs, not scandent or twining ..... **Felicia**
2b Capitula discoid or disciform:
6a Capitula discoid:
7a Capitula laxly corymbose; pappus bristles stiff and tough, somewhat flattened and wider towards the base ..... **Dacryotrichia**
7b Capitula mostly solitary, terminal, pedunculate; pappus bristles finely setaceous ..... **Felicia**
6b Capitula disciform or shortly radiate:
8a Outer female florets in one row ..... **Nolletia**
8b Outer female florets in 2 to many rows:
9a Receptacle ± swollen; style branches with lanceolate appendages; pappus 0 or of 1 or 2 bristles ..... **Dichrocephala**
9b Characters not as above:
10a Pappus of few basally connate bristles, a corona present or not ..... **Grangea**
10b Pappus of many barbellate bristles:
11a Disc florets functionally male; cypselas turbinate; shrubs ..... **Psiadia**
11b Disc florets bisexual, rarely some functionally male; cypselas obovoid-oblong or ellipsoid, compressed; annual or perennial herbs, rarely shrubs:
12a Marginal florets (short rays) yellow ..... **Nidorella**
12b Marginal florets (short rays) white, pink or mauve:
13a Style branch appendages larger than stigmatic area, lanceolate-linear, acute or acuminate; cypselas obovoid-oblong, somewhat compressed, pubescent and glandular ..... **Aster**
13b Style branch appendages lanceolate to triangular; cypselas obovoid-oblong, sometimes compressed, pubescent .. **Conyza**
1b Pappus in 2 series:
14a Capitula radiate:
15a Pappus of bristles only:
16a Style branch appendages longer than stigmatic area, lanceolate-linear, acute or acuminate ..... **Aster**
16b Style branch appendages shorter than stigmatic area, lanceolate to triangular, acute or obtuse ..... ***Erigeron**
15b Pappus of an outer row of scales and an inner row of bristles:
17a Leaves opposite ..... **Engleria**
17b Leaves alternate, rarely lower ones opposite:
18a Leaves small, ericoid; cypselas with 2 resin sacs in ribs ..... **Chrysocoma**
18b Leaves usually broad or long, not ericoid; cypselas without ribs and resin sacs ..... **Aster**
14b Capitula disciform or discoid:
19a Capitula disciform; pappus of bristles only ..... **Conyza**
19b Capitula discoid:
20a Pappus of bristles only ..... **Pteronia**
20b Pappus of bristles and scales:
21a Leaves opposite ..... **Engleria**
21b Leaves alternate, ericoid ..... **Chrysocoma**

Tribe **Inuleae** (including Gnaphalieae and Plucheeae)

Key to genera

1a Stems without resin ducts; leaves generally entire, with hairs with 1 basal cell and a very long terminal cell; involucral bracts with entire or divided sclerenchymatous basal portion; pollen with 2-layered sexine (Gnaphalieae):
2a Leaves denticulate, dentate, serrulate, serrate or lobed; involucral bracts cartilaginous or herbaceous, without papery lamina:
3a Capitula radiate:
4a Receptacle epaleate ..... **Athrixia**
4b Receptacle paleate:
5a Pappus of barbellate bristles and a crown of scales; corolla of disc florets yellow ..... **Philyrophyllum**
5b Pappus of rigid awns; corolla of disc florets purplish ..... **Callilepis**
3b Capitula discoid or disciform:
6a Stem and leaves villose; florets yellow; pappus of short rigid bristles and short scales ..... **Artemisiopsis**
6b Stem and leaves glabrous or puberulous; florets white or blue; pappus of 1 plumose capillary bristle only ..... **Denekia**
2b Leaves entire or else involucral bracts have a papery lamina:
7a Involucral bracts cartilaginous or herbaceous; capitula radiate; disc florets purplish black ..... **Callilepis**
7b Involucral bracts with papery lamina, or if otherwise then capitula disciform or discoid:
8a Involucral bracts entirely cartilaginous or herbaceous; capitula 1-flowered ..... **Stoebe**
8b Involucral bracts conspicuously papery:
9a Florets purple, at least apically or basally:
10a Cypselas with globose hairs; pappus basally connate ..... ***Gamochaeta**
10b Cypselas with clavate or elongated hairs; pappus free ..... **Gnaphalium**
9b Florets yellow:
11a Pappus bristles apically plumose, basally connate; stereome undivided; cypselas with globose, myxogenic twin-hairs ..... **Helichrysopsis**
11b Pappus bristles barbellate, basally free; stereome divided; cypselas never with globose twin-hairs:
12a Capitula with less than 20 florets ..... **Helichrysum**:
12b Capitula with more than 20 florets ..... **Pseudognaphalium**
1b Stems with or without resin ducts; leaves dentate, denticulate, serrulate or pinnatifid, rarely entire, with multiseptate hairs with short cells; involucral bracts with undivided sclenchymatous portion; pollen with 1-layered sexine:
13a Female florets in 1 row, radiate, miniradiate, rarely filiform or absent; style with acute sweeping hairs ending above furcation, rarely with obtuse sweeping hairs (*Anisopappus*) (Inuleae in strict sense):
14a Pappus 0, or of wide scales often with protruding mid-portion or very short, not of capillary bristles:
15a Receptacle paleate ..... **Anisopappus**
15b Receptacle epaleate:
16a Receptacle clothed with many bristles ..... **Geigeria**
16b Receptacle without bristles ..... **Calostephane**
14b Pappus of well-developed capillary bristles:
17a Pappus of bristles and scales:
18a Pappus bristles plumose ..... **Pegolettia**
18b Pappus bristles barbellate:
19a Pappus scales forming a short connate cup; capitula generally disciform ..... **Pulicaria**
19b Pappus scales ± free; capitula discoid ..... **Pegolettia**
17b Pappus of bristles only:
20a Capitula discoid:
21a Capitula small, few-flowered ..... ***Pentanema**
21b Capitula larger, many-flowered ..... **Inula glomerata**
20b Capitula radiate or disciform:
22a Marginal florets radiate or miniradiate ..... **Inula paniculata**
22b Marginal florets filiform:
23a Leaves linear-lanceolate, sessile, margin entire; involucral bracts linear-lanceolate, distinctly imbricate; stems sometimes narrowly winged ..... **Pechuel-Loeschea**
23b Leaves elliptic to ovate, petiolate, margins serrate; involucral bracts many, linear-filiform; stems never winged ..... **Blumea**
13b Female florets in several rows, filiform or rarely radiate; style with obtuse sweeping hairs (Plucheeae):
24a Capitula aggregated in dense compound heads:
25a Pappus absent; receptacle naked ..... **Sphaeranthus**
25b Pappus of free barbellate bristles in 1 row; receptacle paleate ..... **Neojeffreya**
24b Capitula free from each other, if densely grouped then individual heads distinct:
26a Pappus 0 or consisting of scales or of both small scales and bristles:
27a Stems winged; pappus absent, at least in outer florets ..... **Litogyne**
27b Stems not winged; pappus of both bristles and small scales ..... **Porphyrostemma**
26b Pappus of bristles (in one or more rows):
28a Pappus bristles few (1–6):

29a Leaves and/or stems glandular, not scabridulous; involucral bracts glandular, ± glabrous ..... **Nicolasia**
29b Leaves not glandular, scabridulous above; involucral bracts hispid ..... **Porphyrostemma**
28b Pappus bristles many (more than 8):
30a Florets yellow or whitish:
31a Florets whitish; leaves long-decurrent; cypselas pilose ..... ***Pterocaulon**
31b Florets yellow; leaves not long-decurrent; cypselas glabrous or sparsely pilose ..... **Pluchea**
30b Florets pink or purple:
32a Style of outer florets entire or emarginate ..... **Adelostigma**
32b Style clearly 2-lobed:
33a Stems with interrupted stem wings ..... **Pseudoconyza**
33b Stems with continuous wings:
34a Cypselas pubescent; involucral bracts not deciduous; stem wings entire or (in *L. crispata* with elongated terminal panicles) dentate ..... **Laggera**
34b Cypselas glabrous or sparsely pilose; inner involucral bracts deciduous after anthesis; stem wings coarsely dentate; inflorescence corymbose ..... **Pluchea ovalis**

Tribe **Senecioneae**

Key to genera

1a Capitula calyculate (with a calyculus: at least 1 but usually more additional small outer involucral bracts):
2a Petioles prehensile, thickened basally; anther bases with sterile tailed appendages:
3a Leaves auriculate at the base; capitula radiate ..... **Austrosynotis**
3b Leaves exauriculate; capitula disciform ..... **Mikaniopsis**
2b Petioles not prehensile; anther bases without tailed appendages:
4a Crystals in ovary wall simple, plate-like, needle-like or simple:
5a Outer (ray) cypselas dorsiventrally compressed ..... **Cineraria**
5b Outer (ray) cypselas not compressed, or radiate florets 0:
6a Style branch apices without appendages, truncate or rounded ..... **Senecio**
6b Style branch apices with a very short to elongated appendage of fused papillae ..... **Crassocephalum**
4b Crystals in ovary wall compound, drusiform:
7a Plants truly succulent with fleshy leaves and/or stems; style branches with conical to somewhat elongated appendage ..... **Kleinia**
7b Plants at most subsucculent:
8a Style branches truncate, sometimes with a central tuft of fused papillae ..... **Solanecio**
8b Style branches with a long, tapering, papillose appendage ..... **Gynura**
1b Capitula ecalyculate: without any small outer involucral bracts:
9a Capitula radiate:
10a Annual herbs; pappus 0 ..... **Stenops**
10b Perennial herbs, shrublets or herbs; pappus of fine bristles:
11a Disc florets bisexual ..... **Euryops**
11b Disc florets functionally male ..... **Othonna**
9b Capitula discoid:
12a Plants truly succulent with fleshy leaves and/or stems ..... **Kleinia**
12b Plants at most subsucculent:
13a Plants shrubby, sometimes subsucculent ..... **Lopholaena**
13b Plants annual or perennial herbs:
14a Leaves rosulate, linear; cypselas obovoid, glandular; pappus of a few scabrid, soon caducous bristles ..... **Psednotrichia**
14b Leaves cauline, mostly broader than linear; cypselas glabrous or pubescent, not glandular; pappus of a single ± linear scale or of many bristles:
15a Corolla longer than ovary; pappus of many fine bristles ..... **Emilia**
15b Corolla half as long as ovary; pappus of a single ± linear scale ..... **Emiliella**

***Acanthospermum** Schrank

(Heliantheae)

Mendonça: 89 (1943); Wild: 5 (1967).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Acmella Rich. ex Pers.

(Heliantheae)

Persoon: 472 (1807); Jansen: 1 (1985); Lisowski: 228 (1991); Karis & Ryding: 586 (1994).

Annual herbs. **Leaves** opposite and/or basally rosulate. **Capitula** usually radiate, sometimes disciform or discoid, solitary or cymose. **Involucral bracts** in 1–3 rows, subequal or with outer row spreading and longer, entire or irregularly dentate. **Receptacle** narrowly conical, acuminate to obtuse at the apex, paleae laxly enclosing florets. **Ray florets** female, fertile, 3–22 per capitulum, usually small, 2- to 3-lobed, variously coloured. **Disc florets** bisexual, fertile, 4- to 5-lobed, small, variously coloured. **Cypselas** ciliate, glabrous or sometimes with glabrous margins; ray cypselas broadly ovate or elliptic, 3-angled; disc cypselas elliptic, strongly compressed. **Pappus** 0.

Species 30, tropical, some pantropical weeds; sthn trop. Afr. 1: *Acmella caulirhiza* Delile, Angola, Zambia, Zimbabwe, Malawi, Mozambique. According to Lisowski (1991) also in sthn Afr.

Adelostigma Steetz
(Plucheeae)
Steetz: 428 (1864); Wild: 17 (1975); Anderberg: 297 (1994).

Erect annual herbs with resin canals. **Leaves** alternate, linear, entire or denticulate. **Capitula** disciform, solitary, terminal. **Florets**: outer florets female, filiform; central florets functionally male, tubular with 5 dark purple longitudinal lines commencing between lobes. **Anthers** very shortly tailed. **Style** almost undivided. **Cypselas** ellipsoid, sparsely hairy with straight hairs. **Pappus** of free, barbellate bristles in 1 series, each bristle with adpressed teeth.

Species 2, trop. Africa; sthn trop. Afr. 1: *Adelostigma athrixioides* Steetz, Mozambique.

Adenostemma J.R.Forst. & G.Forst.
(Eupatorieae)
Mendonça: 40 (1943); Lisowski: 467 (1991).

Species 24, tropical America and Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Ageratinastrum Mattf.
(Vernonieae)
Mattfeld: 412 (1932); Wild & Pope: 357 (1977b); Pope: 180 (1992); Bremer: 216 (1994); Jeffrey & Beentje: 276 (2000); Bingham & Smith: 140 (2002).

Perennial herbs with annual stems from a woody rootstock; vegetative indumentum of short-stalked flagelliform hairs. **Stems** many, densely leafy, with short internodes, branching above. **Leaves** alternate or spirally arranged, opposite or whorled, sessile to shortly petiolate, felted-tomentose, sparsely pilose or glabrescent, glandular-punctate. **Capitula** homogamous, many, in lax or ± dense clusters at ends of branches, or capitulum-clusters arranged in a large corymbiform cyme. **Involucre** campanulate to subglobose, florets exserted; phyllaries several-seriate, progressively larger to inside. **Receptacle** flat, shallowly alveolate. **Corollas** purple or mauve, darker in upper half, regularly 5-lobed, lobes lanate or pilose-hispid. **Anthers** with a broad hyaline apical appendage and short acute tails at base. **Style**: arms subulate, hairy outside. **Cypselas** obovoid-oblong or turbinate, 4- or 5-sided and obscurely ribbed on the angles, truncate at apex, smooth or strongly rugose on faces between ribs, glabrous or sparsely setulose, minutely brown gland-dotted. **Pappus** persistent, of ± united broad shiny scales lacerate on upper margin, or of scales sometimes free and alternating with paleaceous setae. **Pollen** described as triporate, lophate and emicropunctate.

Species 2, east central trop. Africa; sthn trop. Afr. 2, Zambia, Malawi.

***Ageratum** L.
(Eupatorieae)
Mendonça: 41 (1943); Binns: 29 (1968); Lisowski: 472 (1991); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 2, Angola, Zambia, and sthn Afr.

***Ambrosia** L.
(Heliantheae)
Wild: 2 (1967); Binns: 29 (1968).

Sthn trop. Afr. 1: *Ambrosia maritima* L., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anisopappus Hook. & Arn.
(Inuleae)
Mendonça: 87 (1943); Wild: 45 (1964a); Wild: 80 (1980); Lisowski: 192 (1989); Anderberg: 88 (1991b); White *et al.*: 200 (2001); Beentje: 343 (2002).

Epallage DC.; Binns: 32 (1968). *Sphacophyllum* Benth.; Mendonça: 86 (1943).

Species 30, tropical and sthn Afr.; sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Arctotheca J.C.Wendl.
(Arctotideae)
Pope: 235 (1992).

Species 4, sthn Afr. with 1: *Arctotheca populifolia* (P.J.Bergius) Norl., extending to the foreshore dunes of Mozambique.

Arctotis L.
(Arctotideae)
Norlindh: 403 (1965); Pope: 230 (1992); Bremer: 258 (1994).

Sthn trop. Afr. 1: *Arctotis venusta* Norl., Angola, and sthn Afr.

Artemisia L.
(Anthemideae)
Mendonça: 109 (1943); Lisowski: 245 (1991); White *et al.*: 200 (2001); Beentje: 528 (2002).

Species ± 300, mainly N temperate; sthn trop. Afr. 1: *Artemisia afra* Jacq. ex Willd., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Artemisiopsis S.Moore
(Gnaphalieae)
Wild: 68 (1980); Beentje: 393 (2002).

Monotypic: *Artemisiopsis villosa* (O.Hoffm.) Schweick.; tropical, and sthn trop. Afr., Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Aspilia Thouars
(Heliantheae)
Mendonça: 92 (1943); Wild: 197 (1966); Wild: 39 (1967); Hilliard: 306 (1977); Lisowski: 184 (1991).

Wedelia Jacq. in part; Mendonça: 91 (1943).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aster L.
(Astereae)
Binns: 29 (1968); Lippert: 153 (1973); Lippert: 10 (1980); Lisowski: 39 (1991); Beentje: 468 (2002).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Athrixia Ker Gawl.

(Gnaphalieae)

Kroner: 1 (1980); Lisowski: 228 (1989); Beentje: 454 (2002).

Sthn trop. Afr. 5, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Athroisma DC.

(Helenieae)

Candolle: 516 (1833); Wild: 93 (1980); Karis & Ryding: 536 (1994); Eriksson: 101 (1995).

Perennial herbs or subshrubs. **Leaves** alternate, simple or dissected. **Capitula** disciform or discoid, in dense glomerules. **Involucral bracts** 3: 1 subtending, 2 opposite. **Receptacle** narrowly conical, with slightly conduplicate, entire or slightly lobed paleae. **Florets**: marginal florets 2, bisexual, fertile, filiform; disc florets ± 25, bisexual, fertile, greenish white to purple. **Anthers** caudate. **Cypselas** elliptic to obovate, triquetrous, slightly hairy. **Pappus** a crown or absent.

Species 12, Old World tropics: eastern Africa, Madagascar, NE India, to the Sunda Islands; sthn trop. Afr. 2, Zambia, Zimbabwe.

Austrosynotis C.Jeffrey

(Senecioneae)

Jeffrey: 878 (1986); Bremer: 498 (1994).

Scandent perennial herbs climbing by means of basally thickened petioles. **Leaves** alternate, ovate-cordate, auriculate, palmately veined. **Capitula** radiate, paniculate-corymbose. **Involucre** calyculate. **Florets** yellow. **Anthers** caudate. **Cypselas** oblong, ribbed, glabrous. **Pappus** of many fine bristles.

Monotypic: *Austrosynotis rectirama* (Baker) C.Jeffrey, Tanzania, and Malawi.

Berkheya Ehrh.

(Arctotideae)

Mendonça: 131 (1943); Roessler: 104 (1959); Roessler: 74 (1975); Pope: 237 (1992); Halliday & Wilmot-Dear: 290 (2000).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bidens L.

(Heliantheae)

Moore: 58 (1927); Mendonça: 99 (1943); Wild: 13 (1967); Mesfin Tadesse: 437 (1994); White *et al.*: 200 (2001).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Blainvillea Cass.

(Heliantheae)

Adams: 229 (1956); Adams: 237 (1963); Wild: 38 (1967); Binns: 30 (1968); Karis & Ryding: 589 (1994).

Wedelia Jacq. in part; Mendonça: 91 (1943).

Species 10, pantropical; sthn trop. Afr. 1: *Blainvillea gayana* Cass., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Blepharispermum Wight ex DC.

(Helenieae)

Candolle: 11 (1834); Mendonça: 61 (1943); Wild: 95 (1980); Eriksson: 149 (1992); Karis & Ryding: 536 (1994).

Shrubs, undershrubs or half-climbing shrubs. **Leaves** alternate, petiolate, simple, ovate or lanceolate, entire or sparsely serrate, glabrous or pubescent. **Capitula** disciform, small, aggregated into globose glomerules in terminal corymbs. **Involucral bracts** 3: 1 subtending and 2 opposite. **Receptacle** wart-like with strongly conduplicate, apically 3-lobed paleae. **Marginal florets** 2, female, filiform. **Disc florets** 2 or 4, functionally male. **Anthers** caudate. **Cypselas** elliptic or obcordate, ± triquetrous. **Pappus** of 2–4 stout setae.

Species 15, Old World tropics; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

Blumea DC.

(Inuleae)

Mendonça: 55 (1943); Randeria: 176 (1960); Adams: 260 (1963); Wild: 125 (1969a); Lisowski: 5 (1989); Anderberg: 105 (1991b); Bremer: 284 (1994); Beentje: 319 (2002).

Sthn trop. Afr. ± 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bothriocline Oliv. ex Benth.

(Vernonieae)

Pope: 162 (1992); Jeffrey & Beentje: 136 (2000); White *et al.*: 202 (2001).

Sthn trop. Afr. ± 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Brachylaena R.Br.

(Tarchonantheae)

Mendonça: 54 (1943); Pope: 5 (1992); Beentje: 1 (2000a); Jeffrey & Beentje: 4 (2000); Coates Palgrave: 1139 (2002).

Sthn trop. Afr. 3, Angola, Zimbabwe, Mozambique, and sthn Afr.

Brachythrix Wild & G.V.Pope

(Vernonieae)

Wild & Pope: 25 (1978a); Wild & Pope: 135 (1978b); Jeffrey: 270 (1988); Pope: 176 (1992); Bremer: 218 (1994); Jeffrey & Beentje: 277 (2000).

Perennial herbs with annual stems from a small woody rootstock; rootcrowns with or without lanate tufts; roots many, thong-like and usually swelling to form root-tubers; vegetative indumentum a varying mixture of large, long-stalked, flagelliform hairs intermixed with short-stalked T-shaped hairs. **Stems** erect, usually branching above, leafy, sometimes scapiform. **Leaves** alternate, sessile or subsessile, bases cuneate to auriculate; upper surface ± scabrous, sparsely pubescent or glabrescent; lower surface pubescent or felted, sometimes finely pilose especially on the nerves, or glabrescent, glandular-punctate. **Capitula** homogamous, solitary or few to many in lax corymbiform cymes, or aggregated in ± dense 3–many-capitulate terminal or laterally borne ± scorpioidly cymose clusters. **Involucre** campanulate to broadly cup-shaped, occasionally subglobose or narrowly ovoid. **Phyllaries** imbri-

cate, several-seriate. **Receptacle** ± flat. **Corollas** purple, narrowly funnel-shaped, regularly deeply 5-lobed; lobes apically setulose or glabrous. **Anthers** with a narrowly triangular hyaline appendage at apex and short subobtuse tails at base. **Style**: arms subulate, hairy outside. **Cypselas** narrowly oblong-obovoid, 4- or 5-angular with narrow ribs on the angles, truncate to slightly rounded at apex, faces between ribs with large scattered brownish glandular cells, very sparsely hispid or glabrous. **Pappus** 2-seriate, outer one of short lacerate free or ± united scales or reduced to a low rim, inner one of short very barbellate setae. **Pollen** described as tricolporate, subechinolophate to echinate and micropunctate.

Species 5, south-central and east trop. Africa; sthn trop. Afr. 5. Zambia, Malawi, Mozambique.

Callilepis DC.

(Gnaphalieae)

Wild: 91 (1980); Anderberg: 46 (1991a).

Sthn trop. Afr. 1: *Callilepis laureola* DC., Mozambique, and sthn Afr.

Calostephane Benth.

(Inuleae)

Mendonça: 81 (1943); Wild: 48 (1980); Anderberg: 89 (1991b).

Mollera O.Hoffm.; Mendonça: 80 (1943); Wild: 50 (1980); Lisowski: 53 (1989).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Carduus L.

(Cardueae)

Binns: 30 (1968); Pope: 49 (1992); Jeffrey & Beentje: 45 (2000).

Species ± 90, Eurasian and E African mountains, several species widespread weeds; sthn trop. Afr. 1: *Carduus nyassanus* (S.Moore) R.E.Fr., Zambia, Malawi, and sthn Afr.

Centaurea L.

(Cardueae)

Pope: 53 (1992); Jeffrey & Beentje: 60 (2000).

Species ± 500, mainly Mediterranean and SW Asia, few in N and S America, and trop. Africa; sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Chromolaena** DC.

(Eupatorieae)

Lisowski: 449 (1991); Gautier: 645 (1992); Bremer: 655 (1994).

Eupatorium section *Cylindrocephala* DC.

Sthn trop. Afr. 1: **Chromolaena odorata* (L.) R.M.King & H.Robinson, Zimbabwe, and sthn Afr. The first confirmed record for the region appears to be a collection from northern Zimbabwe from as early as 1967 (*Baretta s. n.* in U). Gautier (1992) lists Angola, Zambia, Malawi and Mozambique among the countries likely to be invaded soon.

***Chrysanthellum** Rich.

(Heliantheae)

Mendonça: 106 (1943); Wild: 34 (1967); Turner: 410 (1988).

Sthn trop. Afr. 1: **Chrysanthellum indicum* DC. subsp. *afroamericanum* B.L.Turner var. *afroamericanum*, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chrysanthemoides Fabr.

(Calenduleae)

Binns: 30 (1968); Norlindh: 157 (1978); White *et al.*: 202 (2001); Beentje: 535 (2002); Coates Palgrave: 1148 (2002).

Sthn trop. Afr. 1: *Chrysanthemoides monilifera* (L.) Norl., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chrysocoma L.

(Astereae)

Wild: 14 (1975); Bayer: 259 (1981); Bremer: 417 (1994).

Sthn trop. Afr. ?2, Mozambique, and sthn Afr.

***Cichorium** L.

(Lactuceae)

Lawalrée *et al.*: 4 (1986); Lisowski: 7 (1991); Jeffrey & Beentje: 64 (2000); Mapaura (Unpublished).

Sthn trop. Afr. 1: **Cichorium intybus* L., cultivated but may become naturalised as in sthn Afr.

Cineraria L.

(Senecioneae)

Binns: 30 (1968); Hilliard: 372 (1977); Jeffrey: 930 (1986); Lisowski: 434 (1991); White *et al.*: 202 (2001).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cirsium Mill. emend. Scop.

(Cardueae)

Binns: 30 (1968); Lisowski: 593 (1991); Pope: 51 (1992); Jeffrey & Beentje: 54 (2000).

Sthn trop. Afr. 1: *Cirsium buchwaldii* O.Hoffm., Zambia, Malawi; 2 species naturalised in sthn Afr.

Conyza Less.

(Astereae)

Mendonça: 50 (1943); Binns: 31 (1968); Wild: 247 (1969b); Wild: 171 (1972a); Beentje: 490 (2002).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Cosmos** Cav.

(Heliantheae)

Karis & Ryding: 615 (1994).

Bidens L. in part; Wild: 13 (1967); Hilliard: 316 (1977).

Sthn trop Afr. 2, weeds in Zambia, Zimbabwe, and sthn Afr., originally from North America.

Cotula L.

(Anthemideae)

Mendonça: 109 (1943); Hilliard: 350 (1977); Beentje: 522 (2002); Bingham

(Unpublished); Mapaura (Unpublished); Phiri (Unpublished).

Matricaria L. in part; Hilliard: 346 (1977).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Crassocephalum Moench

(Senecioneae)

Mendonça: 113 (1943); Jeffrey: 904 (1986).

Sthn trop. Afr. ± 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Crepis L.

(Lactuceae)

Mendonça: 148 (1943); Lawalrée *et al.*: 19 (1986); Pope: 209 (1992); Jeffrey & Beentje: 66 (2000).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dacryotrichia Wild

(Astereae)

Wild: 67 (1973); Wild: 21 (1975); Bremer: 399 (1994).

Annual herbs. **Leaves** alternate, pinnatipartite. **Capitula** laxly corymbose, discoid, hemispheric. **Involucral bracts** 2–3-seriate, imbricate. **Receptacle** ± flat, ± pitted. **Disc florets** bisexual, fertile, yellow. **Cypselas** obovoid, somewhat compressed, pilose. **Pappus** of ± 10 rather stout, flattened, scabrid, persistent bristles in 1 series.

Monotypic: *Dacryotrichia robinsonii* Wild, only known from Zambia.

Denekia Thunb.

(Gnaphalieae)

Mendonça: 59 (1943); Wild: 134 (1969a); Lisowski: 27 (1989); Beentje: 365 (2002).

Monotypic: *Denekia capensis* Thunb.; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Dewildemania O.Hoffm.

(Vernonieae)

Hoffmann: x (1903); Wild & Pope: 343 (1977b); Jeffrey: 271 (1988); Pope: 183 (1992); Bremer: 219 (1994); Jeffrey & Beentje: 271 (2000).

Perennial herbs with erect, usually tufted, annual stems from a small woody rootstock; roots radiating, thong-like. **Stems** ± strict, branching near apex, glabrous, sparsely pilose or pubescent, densely leafy with leaves often grading into phyllaries. **Leaves** spirally arranged, subsessile, filiform to ± elliptic or lanceolate, glabrous. **Capitula** homogamous, 1–many, solitary or in lax terminal corymbiform cymes. **Involucre** broadly cup-shaped to turbinate-campanulate; florets exserted. **Phyllaries** several-seriate, larger towards inside, appressed imbricate to somewhat spreading, outer ones often grading into bracts or leaves below, glabrous to pubescent. **Receptacle** flat or ± dome-shaped, paleaceous with paleae grading from inner phyllaries and usually exceeding them in length. **Corollas** purple, narrowly funnel-shaped, regularly 5-lobed; lobes sparsely to densely setose. **Anthers** with a small triangular hyaline apical appendage, anther thecae brownish with short acute tails at base. **Style**: arms terete, tapering to apex, hairy. **Cypselas** oblong-turbinate and 4- or 5-ribbed, sometimes somewhat angular and 4–5-sided, setulose to hispid, or glabrous, with scattered large brown cells on sides; pappus 2-seriate, outer series of 5–15 broad or narrow scales, inner series of somewhat larger narrow paleaceous setae.

Species 3, south-central and E trop. Africa; sthn trop. Afr. 3, Zambia, Malawi, Mozambique.

Dichrocephala L'Hér. ex DC.

(Astereae)

Mendonça: 43 (1943); Binns: 31 (1968); Wild: 6 (1975); Fayed: 425 (1979); Beentje: 458 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dicoma Cass.

(Mutisieae)

Mendonça: 140 (1943); Pope: 29 (1992); Jeffrey & Beentje: 13 (2000).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dimorphotheca Vaill. ex Moench

(Calenduleae)

Norlindh: 144 (1978).

Sthn trop. Afr. 1: *Dimorphotheca zeyheri* Sond., Zimbabwe, and sthn Afr.

Distephanus Cass.

(Vernonieae)

Cassini: 151 (1817); Robinson & Kahn: 498 (1986); Jeffrey & Beentje: 156 (2000); Coates Palgrave: 1138 (2002).

Gongrothamnus Steetz; Mendonça: 109 (1943); Merxmüller: 84 (1967). *Vernonia* Schreb. in part; Pope: 69 (1992).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Eclipta L.

(Heliantheae)

Mendonça: 89 (1943); Wild: 59 (1967); Binns: 31 (1968); Karis & Ryding: 583 (1994).

Sthn trop. Afr. 1: **Eclipta prostrata* (L.) L. (=*E. alba* (L.) Hassk.), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.; cosmopolitan weed originally from Asia.

Elephantopus L.

(Vernonieae)

Linnaeus: 814 (1753); Linnaeus: 355 (1754); Philipson: 299 (1938); Mendonça: 37 (1943); Pope: 186 (1992); Bremer: 232 (1994); Jeffrey & Beentje: 280 (2000).

Perennial ± hirsute herbs with annual stems from a woody rootstock; roots many, thong-like; vegetative indumentum sparse to dense, consisting of patent to appressed, stiff, bristle-like hairs. **Stems** 1–several, leafy or scapiform, branching

above. **Leaves** alternate, often basal, sessile, or narrowly attenuate and petiole-like before widening into a ± stem-clasping, ± stem-sheathing base; upper leaves grading into leaf-like bracts. **Capitula** homogamous, few-flowered, many, syncephalous in bracteate glomerules; glomerules terminal on stiff inflorescence branches, laxly corymbiform-cymose tending to subscorpioid-cymose. **Involucre** narrowly ovoid-cylindric; phyllaries few-seriate, ± cartilaginous with pungent apiees, strigose to densely hispid or glabrescent. **Receptacle** small, plane. **Corollas** 5-lobed, asymmetric, more deeply cleft on one side. **Anthers** sagittate at base. **Style**: branches linear-terete, hairy. **Cypselas** narrowly turbinate-cylindric, ± 10-ribbed, usually glandular between ribs, setulose; pappus 1-seriate, setae 5–10 with bases broad, scale-like and usually overlapping, gradually or abruptly tapering and subterete, barbellate above.

Speeies ± 32, N and S America, Australia, Asia, Madagascar, ± 9 from Africa; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Emilia Cass.

(Senecioneae)

Mendonça: 111 (1943); Jeffrey: 908 (1986).

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Emiliella S.Moore

(Senecioneae)

Moore: 225 (1918); Mendonça: 113 (1943); Torre: 85 (1975); Lisowski: 409 (1991); Bremer: 501 (1994).

Annual herbs. **Leaves** alternate, simple, sessile to shortly petiolate, oblong-obovate to lanceolate, slightly serrate. **Capitula** discoid, small, solitary, with ± 8 florets, campanulate-cylindric. **Involucre** of 1 series of bracts, ecalyculate. **Receptacle** flat, naked. **Florets** all bisexual, tubular; corolla shorter than ovary, pink to violet. **Style**: branches truncate, penicillate at apex. **Cypselas** linear, ribbed, glabrous. **Pappus** a single linear to linear-ovate scale (reduced bristle?) or 0.

Species 5, sthn trop. Afr., Angola and Zambia.

Engleria O.Hoffm.

(Astereae)

Mendonça: 110 (1943); Merxmüller: 56 (1967).

Adenogonum Welw. ex Hiern: 290 (1898).

Sthn trop. Afr. 1: *Engleria decumbens* (Welw. ex Hiern) Hiern, Angola, and sthn Afr.

Enydra Lour.

(Heliantheae)

Wild: 35 (1967).

Sthn trop. Afr. 1: *Enydra fluctuans* Lour., Zambia, Mozambique, and sthn Afr.

***Erigeron** L.

(Astereae)

Mendonça: 46 (1943); Binns: 32 (1968); Wild: 34 (1975); Beentje: 479 (2002).

Sthn trop. Afr. 1: **Erigeron karvinskianus* DC., Angola, Zimbabwe, Malawi, and sthn Afr.

Erlangea Sch.Bip.

(Vernonieae)

Mendonça: 4 (1943) (most species cited here are now placed under *Bothriocline*); Pope: 160 (1992); Jeffrey & Beentje: 132 (2000).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Erythrocephalum Benth.

(Mutisieae)

Bentham: 488 (1873); Mendonça: 139 (1943); Jeffrey: 201 (1967); Wild: 173 (1972b); Pope: 20 (1992); Bremer: 99 (1994); Jeffrey & Beentje: 26 (2000).

Annual herbs, or suffrutices with annual stems from a woody rootstock; vegetative indumentum of appressed, fine, ± matted hairs usually intermixed with large, patent, many-celled uniseriate hairs each bearing a fine filamentous terminal cell. **Stems** 1–several, simple or branching near apex, araneose-lanate to coarsely pubescent. **Leaves** alternate, semi-amplexicaul, usually discolorous, indumentum as for stem but denser on lower surface of lamina, sometimes ± scabrid. **Capitula** heterogamous, discoid or radiate, 1–many, solitary and terminal on stem and branches when present. **Involucre** ± broadly campanulate, ± truncate at base. **Phyllaries** many-seriate, appressed imbricate, the innermost grading into paleae of receptacle. **Receptacle** paleate. **Ray florets** bisexual, with 2-lipped, deep red corollas, outer lip (ray) large, 3-fid, inner lip shorter, consisting of 2 linear lobes, or ray florets absent. **Disc florets** deep red or creamy white, occasionally orange-tinged, bisexual and regular, abruptly dilated from near base into a deeply lobed limb, lobes erect, linear. **Anthers**: bases produced into oblong, fimbriate or ciliolate tails. **Styles** deeply 2-fid, branch apices shortly conical with a sub-distal fringe of hairs. **Cypselas** barrel-shaped to cylindric, ± 5-angled or ribbed, usually with a ± swollen or lobed cartilaginous carpopodium at base, minutely puberulous or glabrous; pappus of 4 or 5 caducous barbellate setae.

Species ± 12, trop. Africa; sthn trop. Afr. ± 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Ethulia L.f.

(Vernonieae)

Mendonça: 1 (1943); Pope: 172 (1992); Jeffrey & Beentje: 111 (2000).

Hoehnelia Schweinf.; Wild & Pope: 140 (1978b).

Species 19, trop. Africa and Indomalesia; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Euryops (Cass.) Cass.

(Senecioneae)

Nordenstam: 1 (1968); Jeffrey: 931 (1986).

Sthn trop. Afr. 1: *Euryops transvaalensis* Klatt subsp. *setilobus* (N.E.Br.) B.Nord., Zimbabwe; most species confined to sthn Afr.

Felicia Cass.

(Astereae)

Mendonça: 44 (1943); Grau: 1 (1980); Beentje: 470 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Flaveria Juss.

(Helenieae)

Pope: 111 (1975).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

*Galinsoga Ruiz & Pav.

(Heliantheae)

Wild: 9 (1967); Binns: 32 (1968).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, and sthn Afr.

*Gamochaeta Wedd.

(Gnaphalieae)

Anderberg: 155 (1991a); Hind *et al.*: 71 (1993); Anderberg: 357 (1994); Beentje: 401 (2002); Mapaura (Unpublished).

Sthn trop. Afr. 1; **Gamochaeta purpurea* (L.) Cabrera (=*G. pensylvanica* (Willd.) Cabrera; =*Gnaphalium purpureum* L.), Zimbabwe, widespread weed; 5 species naturalised in sthn Afr.

Gazania Gaertn.

(Arctotideae)

Mendonça: 129 (1943); Roessler: 95 (1975); Pope: 252 (1992).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Geigeria Griess.

(Inuleae)

Mendonça: 82 (1943); Wild: 53 (1980); Beentje: 340 (2002); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Gerbera L.

(Mutisieae)

Mendonça: 146 (1943); Binns: 32 (1968); Pope: 44 (1992); Jeffrey & Beentje: 8 (2000).

Piloselloides (Less.) Jeffrey; Wild: 202 (1972b).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gnaphalium L.

(Gnaphalieae)

Mendonça: 62 (1943); Wild: 71 (1980); Lisowski: 58 (1989); Beentje: 395 (2002).

Amphidoxa DC.; Mendonça: 61 (1943).

Sthn trop. Afr. ± 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gossweilera S.Moore

(Vernonieae)

Moore: 291 (1908); Mendonça: 39 (1943); Bremer: 221 (1994).

Perennial herbs or shrubs. **Leaves** alternate, lanceolate, entire. **Capitula** discoid, many-flowered, fairly small, arranged in corymbiform cymes. **Involucre** campanulate; bracts free, in many rows. **Receptacle** paleate; paleae spatulate. **Florets** purplish. **Anthers** shortly sagittate at base. **Style branches** filiform. **Cypselas** oblong-ovoid, glabrous. **Pappus** a tubular, membranous cupule.

Species 2, only known from Angola.

Grangea Adans.

(Astereae)

Mendonça: 43 (1943); Wild: 10 (1975); Fayed: 450 (1979); Beentje: 466 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

*Guizotia Cass.

(Heliantheae)

Wild: 11 (1967); Karis & Ryding: 610 (1994).

Sthn trop. Afr. 1: **Guizotia scabra* (Vis.) Chiov., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gutenbergia Sch.Bip.

(Vernonieae)

Schultz: 119, t. 4 (1840); Mendonça: 2 (1943); Wild & Pope: 347 (1977b); Jeffrey: 249 (1988); Pope: 151 (1992); Bremer: 221 (1994); Jeffrey & Beentje: 121 (2000); Bingham & Smith: 140 (2002). *Paurolepis* S.Moore; Wild & Pope: 346 (1977b).

Annual or perennial herbs with simple to much-branched, erect or decumbent stems; vegetative indumentum of short-stalked, long-armed, symmetrical T-shaped hairs. **Leaves** opposite, at least those on lower stems, alternate or sometimes in whorls of 3, sessile or petiolate, upper surface of lamina sparsely pilose to scabridulous, lower surface closely whitish-silvery araneose-felted. **Capitula** usually small, few to many, laxly arranged in corymbiform cymes, or shortly stalked in small clusters, homogamous. **Involucre** obconic to cyathiform; phyllaries ± diverging, increasing in size to inside, membranous or scarious, usually with subhyaline margins. **Receptacle** plane or alveolate. **Corollas** purple or mauve, regular, narrowly infundibuliform, deeply 5-lobed, usually puberulous, lobes sometimes with acicular bristles and/or T-shaped to Y-shaped hairs. **Anthers** lanceolate-appendiculate at apex, obtuse at base. **Style**: arms linear, hairy. **Cypselas** obovoid-oblong or turbinate, rounded or truncate at apex and ecostate, or 4–6-, or 8–10-ribbed, polished and smooth or with hooked or ± straight, simple or bifid and globose-glandular trichomes. **Pappus** 0, or of a few short, caducous, barbellate setae, or of persistent overlapping scales.

Species ± 20, trop. Africa; sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Gynura Cass.

(Senecioneae)

Cassini: 391 (1825); Mendonça: 111 (1943); Davies: 335 (1978); Bremer: 503 (1994); White *et al.*: 203 (2001).

Crassocephalum Moench in part.

Sthn trop. Afr. 3, Angola, Zambia, Malawi.

Gyrodoma Wild
(Astereae)
Wild: 294 (1974); Wild: 3 (1975); Bremer: 400 (1994).

Annual herbs. **Leaves** alternate, pinnatifid. **Capitula** heterogamous, radiate, solitary, pedunculate. **Involucre** broadly campanulate to patelliform; bracts ± in 2 series. **Receptacle** hemispheric-conic, nude. **Florets**: ray florets female, in 1 series, white or pale blue; disc florets bisexual, many, yellow. **Anthers** appendiculate at apex. **Style branches** flattened with appendages broadly triangular to ovate and rounded or obtuse at apex. **Cypselas** obovoid, slightly compressed, pubescent. **Pappus** of minute scales.

Monotypic: *Gyrodoma hispida* (Vatke) Wild, only recorded from Mozambique.

Haplocarpha Less.
(Arctotideae)
Mendonça: 129 (1943); Pope: 232 (1992); Bremer: 260 (1994); Halliday & Wilmot-Dear: 286 (2000).

Species 8, Ethiopia, E Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Helianthus L.
(Heliantheae)
Wild: 57 (1967).

Sthn trop. Afr. 2, Mozambique; 3 species naturalised in sthn Afr.

Helichrysopsis Kirp.
(Gnaphalieae)
Hilliard & Burtt: 207 (1981); Anderberg: 153 (1991a); Anderberg: 358 (1994).

Monotypic: *Helichrysopsis septentrionale* (Vatke) Hilliard, coastal Mozambique, and sthn Afr.

Helichrysum Mill.
(Gnaphalieae)
Mendonça: 63 (1943); Wild: 191 (1983); Lisowski: 68 (1989); Anderberg: 141 (1991a); Anderberg: 358 (1994); Beentje: 349 (2000b); White *et al.*: 203 (2001); Beentje: 403 (2002); Mapaura & Timberlake: 163 (2002); Msekandiana & Mlangeni: 34 (2002).

Achyrocline (Less.) DC.; Binns: 28 (1968). *Calomeria* partly in sense of Heine: 115 (1967); Lebrun & Stork: 266 (1997). *Humea* in sense of Moore: 112, tab. 5: 1–3 (1911); Wild: 154 (1964b); Mapaura & Timberlake: 172 (2002).

Sthn trop. Afr. ± 90, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hirpicium Cass.
(Arctotideae)
Roessler: 333 (1959); Roessler: 86 (1975); Pope: 246 (1992); Halliday & Wilmot-Dear: 296 (2000).

Berkheyopsis O.Hoffm.; Mendonça: 130 (1943).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hypericophyllum Steetz
(Helenieae)
Mendonça: 106 (1943); Pope: 104 (1975); Lisowski: 482 (1991).

Sthn trop. Afr. ± 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Hypochaeris L.
(Lactuceae)
Pope: 192 (1992); Jeffrey & Beentje: 73 (2000).

Sthn trop. Afr. 2, widespread weeds; 4 species naturalised in sthn Afr.

Inula L.
(Inuleae)
Mendonça: 76 (1943); Wild: 38 (1980); Lisowski: 38 (1989); Anderberg: 97 (1991b); Beentje: 322 (2002).

Sthn trop. Afr. ± 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Inulanthera Källersjö
(Anthemideae)
Källersjö: 539 (1985); Bremer: 455 (1994).

Athanasia L. in part; Mendonça: 108 (1943).

Sthn trop. Afr. 2, Angola, Zimbabwe, and sthn Afr.

Jeffreya Wild
(Astereae)
Wild: 295 (1974); Wild: 5 (1975); Beentje: 476 (2002).

Annual or perennial herbs, slender, erect. **Leaves** proximally opposite, distally alternate, sessile, linear, entire or sparsely serrulate. **Capitula** terminal, solitary, heterogamous and radiate. **Involucre** ovoid; bracts in 1 or 2 rows. **Receptacle** flat to conical, epaleate. **Ray florets** in 1 row, female. **Disc florets** many, bisexual, proximally cylindric, more distally campanulate and with 5 teeth. **Anthers** 5, obtuse at base, with triangular appendages at apex. **Style** cylindric; branches flattened, minutely puberulous. **Cypselas** ellipsoid, slightly compressed, smooth and glabrous with slightly ribbed margins. **Pappus** 0 or a minute annular rim.

Species 2, trop. Africa; sthn trop. Afr. 1: *Jeffreya palustris* (O.Hoffm.) Wild, Zambia.

Kleinia Mill.
(Senecioneae)
Jeffrey: 923 (1986); Lisowski: 420 (1991).

Notonia DC.; Mendonça: 113 (1943).

Sthn trop. Afr. ± 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lactuca L.
(Lactuceae)
Mendonça: 149 (1943); Pope: 196 (1992); Jeffrey & Beentje: 77 (2000);

Kilian: 76 (2001).

Sthn trop. Afr. 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Laggera Benth.
(Plucheeae)
Mendonça: 56 (1943); Anderberg: 161 (1991c); Anderberg: 300 (1994); Beentje: 352 (2002).

Sthn trop. Afr. ± 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Launaea Cass.
(Lactuceae)
Pope 214 (1992); Kilian: 1 (1997); Jeffrey & Beentje: 98 (2000).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Litogyne Harv.
(Plucheeae)
Anderberg: 168 (1991c); Anderberg: 300 (1994); Beentje: 368 (2002).

Epaltes Cass. in part, as to *E. gariepina* (DC.) Steetz; Mendonça: 60 (1943); Wild: 35 (1980).

Monotypic: *Litogyne gariepina* (DC.) Anderb., tropical and sthn trop. Afr., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lopholaena DC.
(Senecioneae)
Jeffrey: 932 (1986); Lisowski: 436 (1991); Bremer: 505 (1994); Coates Palgrave: 1146 (2002); Msekandiana & Mlangeni: 35 (2002).

Othonna L. in part; Mendonça: 126 (1943).

Sthn trop. Afr. 3, Angola, Zambia, Malawi.

Melanthera Rohr
(Heliantheae)
Mendonça: 95 (1943); Wild: 1 (1965); Wild: 48 (1967); Lisowski: 204 (1991); Karis & Ryding: 595 (1994).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Microglossa DC.
(Astereae)
Mendonça: 47 (1943); Wild: 26 (1975); White *et al.*: 203 (2001); Beentje: 481 (2002); Coates Palgrave: 1139 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mikania Willd.
(Eupatorieae)
Mendonça: 42 (1943); Lisowski: 457 (1991); Bremer *et al.*: 647 (1994); White *et al.*: 205 (2001).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mikaniopsis Milne-Redh.
(Senecioneae)
Jeffrey: 878 (1986); Bremer: 505 (1994).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

*Montanoa La Llave & Lex.
(Heliantheae)
Wild: 57 (1967); Hilliard: 305 (1977); Lisowski: 221 (1991); Karis & Ryding: 583 (1994).

Sthn trop. Afr. 2, Zimbabwe, both originally from Central America; also naturalised in sthn Afr.

Muschleria S.Moore
(Vernonieae)
Moore: 89 (1914); Mendonça: 2 (1943) (as "*Muschlera*"); Bremer: 224 (1994).

Perennial herbs. **Leaves** linear. **Capitula** few-flowered and aggregated to secondary, campanulate or globose heads, which may be solitary or arranged in a corymbose-paniculate synflorescence. **Florets** purple. **Cypselas** obovoid, ± 10-ribbed, glandular between ribs. **Pappus** a short, undulate corona.

Monotypic: *Muschleria angolensis* S.Moore, Angola.

Neojeffreya Cabrera
(Plucheeae)
Cabrera: [160] (1978); Lisowski: 37 (1989); Anderberg: 301 (1994); Beentje: 391 (2002).

Annual herbs, without resin canals. **Leaves** long-decurrent, denticulate to sinuate, woolly-hairy. **Capitula** disciform, small, aggregated in dense terminal glomerules. **Receptacle** paleate; paleae marginally laciniate. **Florets**: outer ones female; central ones perfect. **Cypselas** laterally compressed. **Pappus** of free, barbellate bristles.

Monotypic: *Neojeffreya decurrens* (L.) Cabrera, Madagascar, and sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique.

Nicolasia S.Moore
(Plucheeae)
Mendonça: 59 (1943); Merxmüller: 1 (1954); Wild: 26 (1980); Lisowski: 30 (1989); Beentje: 349 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Nidorella Cass.
(Astereae)
Mendonça: 48 (1943); Wild: 62 (1975); Bremer: 427 (1994); Beentje: 486 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Nolletia Cass.
(Astereae)
Wild: 18 (1975); Bremer: 427 (1994).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, and sthn Afr.

Omphalopappus O.Hoffm.

(Vernonieae)

Hoffmann: 234 (1891); Mendonça: 91 (1943); Bremer: 224 (1994).

Perennial herbs. **Leaves** alternate, linear. **Capitula** homogamous, fairly small, crowded, corymbose. **Receptacle** conxex, paleate. **Florets** purple. **Cypselas** cylindric, 5-angular. **Pappus** a short, denticulate corona.

Monotypic: *Omphalopappus newtonii* O.Hoffm., only recorded from Angola.

Osteospermum L.

(Calenduleae)

Mendonça: 129 (1943).

Tripteris Less.; Mendonça: 127 (1943); Norlindh: 146 (1978); Beentje: 531 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Othonna L.

(Senecioneae)

Mendonça: 126 (1943); Hilliard: 513 (1977); Jeffrey: 876 (1986); Bremer: 506 (1994).

Sthn trop. Afr. 4(5), Angola, Zimbabwe, ?Malawi (*Othonna whyteana* Britten), and sthn Afr.

***Parthenium** L.

(Heliantheae)

Wild: 8 (1967); Hilliard: 294 (1977); Karis & Ryding: 622 (1994).

Sthn trop. Afr. 1: **Parthenium hysterophorus* L., Mozambique, and sthn Afr.

Pasaccardoa Kuntze

(Mutisieae)

Kuntze: 354 (1891); Mendonça: 139 (1943) (as *Passacardoa*); Jeffrey: 208 (1967);Wild: 192 (1972b); Pope: 26 (1992); Bremer: 104 (1994); Jeffrey & Beentje: 19 (2000).

Annual herbs, or suffrutices with annual stems from a woody rootstock; vegetative indumentum of fine flagelliform hairs each consisting of an appressed filamentous terminal cell borne on a uniseriate many-celled stalk. **Leaves** alternate, narrowly oblanceolate to elliptic, somewhat discolorous, densely araneose-lanate on undersurface, gland-dotted. **Capitula** heterogamous, radiate, few to many, solitary and terminal on branches sometimes also subsessile along branches, subtended by leaf-like bracts. **Phyllaries** many, many-seriate, araneose-lanate to puberulous, at least outer ones subulate-aristate with stiff, squarrose or recurved apices, or lamina straight and pungent. **Receptacle** deeply alveolate; paleae absent. **Ray florets** neuter, stamens and style absent or rudimentary, corollas deep red or creamy white; rays erect, 3-fid, inner lip wanting; ovary rudimentary, pappus of many narrow scales. **Disc florets** deep red or creamy white, bisexual and regular. **Anthers**: apical appendages narrowly triangular, theca bases sagittate with tapering-acute fimbriate or ciliolate tails. **Style** deeply 2-fid, apices subobtuse with a subdistal fringe of hairs. **Cypselas** subcylindric, 10-ribbed with many stiff white hairs; pappus several-seriate of many spreading narrowly lanceolate scales.

Species ± 4, trop. Africa; sthn trop. Afr. 3, Angola, Zambia.

Pechuel-Loeschea O.Hoffm.

(Inuleae)

Merxmüller: 135 (1967); Anderberg: 289 (1994).

Pluchea Cass. in part; Wild: 132 (1969a).

Monotypic: *Pechuel-Loeschea leubnitziae* (Kuntze) O.Hoffm., Zimbabwe, and sthn Afr.

Pegolettia Cass.

(Inuleae)

Mendonça: 79 (1943); Wild: 46 (1980); Anderberg: 158 (1986); Beentje: 332 (2002).

Sthn trop. Afr. 1: *Pegolettia senegalensis* Cass., Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

***Pentanema** Cass.

(Inuleae)

Anderberg: 100 (1991b); Mesfin Tadesse: 406 (1995); Beentje: 334 (2002).

Vicoa Cass.; Mendonça: 80 (1943); Wild: 45 (1980); Lisowski: 52 (1989).

Sthn trop. Afr. 1: **Pentanema indicum* (L.) Y.Ling, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Philyrophyllum O.Hoffm.

(Gnaphalieae)

Wild: 51 (1980); Anderberg: 43 (1991a); Herman: 107 (1999).

Monotypic: *Philyrophyllum schinzii* O.Hoffm., Angola, Zimbabwe, and sthn Afr.

Phymaspermum Less. emend. Källersjö

(Anthemideae)

Källersjö: 535 (1985); Bremer & Humphries: 94 (1993); Bremer: 451 (1994).

Brachymeris DC.

Sthn trop. Afr. 1: *Phymaspermum athanasioides* (S.Moore) Källersjö, which is possibly conspecific with *P. bolusii* (Hutch.) Källersjö and *P. montanum* (Hutch.) Källersjö (fide Källersjö 1985: 537), Zimbabwe, and sthn Afr.

Pleiotaxis Steetz

(Mutisieae)

Moore: 64 (1927); Mendonça: 133 (1943); Pope: 11 (1992); Jeffrey & Beentje: 21 (2000); Bingham & Smith: 140 (2002).

Sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pluchea Cass.

(Plucheeae)

Mendonça: 58 (1943); Wild: 132 (1969a); Lisowski: 21 (1989); King-Jones: 1 (2001); Beentje: 359 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Porphyrostemma Benth. ex Oliv.

(Plucheeae)

Oliver: 96 (1873); Wild: 33 (1980); Lisowski: 33 (1989); Anderberg: 301 (1994); Beentje: 338 (2002).

Erect, hispid, annual or perennial herbs. **Leaves** alternate, simple, sessile to pseudopetiolate. **Capitula** heterogamous and disciform, solitary or a few together in axils of upper leaves. **Involucral bracts** narrow, in many rows, outermost shortest. **Receptacle** hairy, pitted. **Outer florets** female, very narrowly tubular, with minute lobes. **Inner florets** bisexual, tubular, widening upwards; lobes 5, triangular. **Anthers** saggitate at base. **Style arms** exserted, linear and obtuse at apex. **Cypselas** ellipsoid, hispid or silky with straight hairs. **Pappus** of 5–9 free, ± smooth bristles, sometimes with an additional row of short connate scales.

Species 3, trop. Africa; sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique.

Prenanthes L.

(Lactuceae)

Linnaeus: 797 (1753); Bremer: 185 (1994); Jeffrey & Beentje: 87 (2000).

Perennial herbs. **Leaves** entire or mostly variously lobed-pinnatisect, usually ovate-cordate in outline. **Capitula** slender and rather few-flowered, often pendent, in corymbose to thyrsoid-paniculate, often elongate synflorescences. **Florets** violet, bluish, pink, purple, white, or rarely yellow; corolla glabrous. **Cypselas** terete to narrowly fusiform, 3- or 4-ribbed, glabrous and smooth or scabrid-hispid, not or hardly constricted below apex. **Pappus** of many stout, scabrid-barbellate bristles.

Species ± 30, Asia, N America, Central and S Europe, Canary Islands, Socotra, and trop. Africa; sthn trop. Afr.: ?Angola (fide Brummitt (Unpublished); no other record seen).

Psednotrichia Hiern

(Senecioneae—formerly placed in Astereae)

Hiern: 289 (1898); Mendonça: 42 (1943); Bremer: 430 (1994); Anderberg & Karis: 375 (1995).

Oligothrix DC.; Mendonça: 126 (1943); Bremer: 506 (1994). *Xyridopsis* B.Nord.: 75 (1978).

Small annual herbs. **Leaves** rosulate, linear. **Capitula** discoid. **Involucral bracts** in 1 row. **Florets** yellow. **Cypselas** obovoid, 5-ribbed, glandular. **Pappus** of few, scabrid, soon caducous bristles.

Species 2, Angola.

Pseudoconyza Cuatrec.

(Plucheeae)

Beentje: 357 (2002).

Blumea DC. in part; Wild: 128 (1969a).

Monotypic genus: *Pseudoconyza viscosa* (Mill.) D'Arcy, pantropical weed; sthn trop. Afr.: Zambia, Zimbabwe, Mozambique, and sthn Afr.

Pseudognaphalium Kirp.

(Gnaphalieae)

Hilliard & Burtt: 202 (1981); Lisowski: 64 (1989); Anderberg: 146 (1991a); Anderberg: 362 (1994); Beentje: 398 (2002).

Gnaphalium L. in part; Wild: 71 (1980).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Psiadia Jacq.

(Astereae)

Mendonça: 53 (1943); Wild: 23 (1975); Beentje: 514 (2002).

Sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique, and sthn Afr.

*Pterocaulon Elliott

(Plucheeae)

Elliott: 323 (1823); Wild: 36 (1980); Anderberg: 302 (1994).

Herbs without resin canals. **Leaves** long-decurrent, dentate to serrate. **Capitula** disciform, terminal, forming dense glomerules, or arranged in long, ± dense spikes. **Florets**: outer ones female, filiform; central ones perfect. **Style branches** with acute hairs not reaching the furcation. **Cypselas** ellipsoid, with straight hairs. **Pappus** of free, barbellate bristles.

Species 18, tropics and warm regions of Old and New World; sthn trop. Afr. 1: **Pterocaulon decurrens* (L.) S.Moore, Zambia, Zimbabwe, Malawi, Mozambique.

Pteronia L.

(Astereae)

Hutchinson & Phillips: 277 (1917); Wild: 29 (1975); Bremer: 408 (1994).

Sthn trop. Afr. 1: *Pteronia smutsii* Hutch., only known from type gathering, Zambia; most species confined to sthn Afr.

Pulicaria Gaertn.

(Inuleae)

Wild: 70 (1980); Anderberg: 109 (1991b); Anderberg: 290 (1994).

Sthn trop. Afr. 1: *Pulicaria scabra* (Thunb.) Druce, Zambia, Zimbabwe, and sthn Afr.

Rastrophyllum Wild & G.V.Pope

(Vernonieae)

Wild & Pope: 325 (1977a); Wild & Pope: 345 (1977b); Pope: 172 (1992); Bremer: 225 (1994); Bingham & Smith: 149 (2002).

Annual herbs. **Leaves** alternate, deeply pinnatisect. **Capitula** corymbose, homogamous, subglobose; involucral bracts in 4 or 5 rows; receptacle reticulo-foveolate. **Florets** bisexual, many, violet-purplish, glandular. **Style branches** subulate, hirsute. **Cypselas** obovoid, 4-sulcate, densely tuberculate. **Pappus** absent.

Species 2, Tanzania, and Zambia.

Schistostephium Less.

(Anthemideae)

Hutchinson: 99 (1916); Hilliard: 357 (1977); Lisowski: 242 (1991); Bremer & Humphries: 160 (1993); Bremer: 477 (1994); Beentje: 526 (2002).

Sthn trop. Afr. 7, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Schkuhria Roth

(Heleniеae)

Pope: 119 (1975).

Sthn trop. Afr. 1: **Schkuhria pinnata* (Lam.) Thell., Zimbabwe, Mozambique, and sthn Afr.

Sclerocarpus Jacq.

(Heliantheae)

Mendonça: 90 (1943); Wild: 37 (1967).

Sthn trop. Afr. 1: *Sclerocarpus africanus* Jacq. ex Murray, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Senecio L.

(Senecioneae)

Mendonça: 117 (1943); Jeffrey: 879 (1986); White *et al.*: 205 (2001); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sigesbeckia L.

(Heliantheae)

Mendonça: 89 (1943) (as *Siegesbeckia*); Wild: 36 (1967); Karis & Ryding: 612 (1994).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Solanecio (Sch.Bip.) Walp.

(Senecioneae)

Jeffrey: 920 (1986); Coates Palgrave: 1148 (2002).

Crassocephalum Moench in part; Mendonça: 113 (1943).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sonchus L.

(Lactuceae)

Mendonça: 151 (1943); Boulos: 287 (1972); Lawalrée *et al.*: 27 (1986); Pope: 221 (1992); Jeffrey & Beentje: 92 (2000).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sphaeranthus L.

(Plucheeae)

Mendonça: 60 (1943); Wild: 96 (1980); Lisowski: 216 (1989); Beentje: 370 (2002).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Spilanthes Jacq.

(Heliantheae)

Mendonça: 98 (1943); Wild: 60 (1967); Jansen: 231 (1981); Lisowski: 225(1991).

Species 6, pantropical; sthn trop. Afr. 1: *Spilanthes costata* Benth. (=*S. acmella* (L.) Murray), Angola, and sthn Afr.

Stenops B.Nord.

(Senecioneae)

Nordenstam: 73 (1978); Jeffrey: 908 (1986); Bremer: 509 (1994).

Annual herbs. **Leaves** entire or slightly serrate. **Capitula** radiate, solitary or laxly corymbose, small, few-flowered. **Involucre** ecalyculate; bracts connate. **Receptacle** conical. **Florets**: ray florets white or pale mauve; disc florets perfect, yellow. **Filaments**: collar much dilated. **Cypselas** oblong, 5-ribbed or thickly 5- to 7-winged, glabrous. **Pappus** absent.

Species 2, trop. Africa; sthn trop. Afr. 1: *Stenops helodes* B.Nord., Zambia.

Stoebe L.

(Gnaphalieae)

Mendonça: 76 (1943); Nogueira: 127 (1977); Wild: 67 (1980); Lisowski: 56 (1989); White *et al.*: 207 (2001); Beentje: 452 (2002); Coates Palgrave: 1146 (2002); Phiri (Unpublished).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stomatanthes R.M.King & H.Rob.

(Eupatorieae)

King & Robinson: 430 (1970); Lisowski: 452 (1991).

Eupatorium as to *E. africanum* Oliv. & Hiern; Mendonça: 41 (1943); Binns: 32 (1968).

Species 16, tropical America, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Synedrella Gaertn.

(Heliantheae)

Gaertner: 456 (1791); Mendonça: 98 (1943); Karis & Ryding: 598 (1994); Lisowski: 117 (1991); Turner: 39 (1994).

Annual or short-lived perennial herbs. **Leaves** opposite, crenate-serrate. **Capitula** radiate, glomerate or sometimes solitary. **Involucral bracts** few, in a single row. **Receptacle** with small, narrow paleae. **Florets**: rays female, yellow; disc florets 4-lobed, yellow. **Anthers**: appendages truncate to obtuse. **Cypselas**: ray cypselas elliptic, dorsiventrally compressed, with deeply lobate wings; disc cypselas clavate, tuberculate. **Pappus** in ray florets of 2 awns, connate to the wing; in disc florets of 2 or 3(4) awns.

Monotypic: **Synedrella nodiflora* Gaertn., tropical America, naturalised throughout tropics; sthn trop. Afr.: Angola, Malawi.

*Tagetes L.

(Heleniеae)

Mendonça: 107 (1943); Pope: 115 (1975); Lisowski: 491 (1991).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Taraxacum Weber ex F.H.Wigg.

(Lactuceae)

Pope: 212 (1992); Jeffrey & Beentje: 75 (2000).

Sthn trop. Afr. 1 (aggregate) often referred to as *Taraxacum officinale*, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Tarchonanthus L.

(Tarchonantheae)

Mendonça: 54 (1943); Pope: 9 (1992); Beentje: 81 (1999); Jeffrey & Beentje: 6 (2000); Coates Palgrave: 1144 (2002); Herman: 26 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

*Tithonia Desf. ex Juss.

(Heliantheae)

Wild: 55 (1967); La Duke: 453 (1982); Karis & Ryding: 605 (1994).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tolpis Adans.

(Lactuceae)

Lawalrée *et al.*: 6 (1986); Pope: 190 (1992); Jeffrey & Beentje: 64 (2000).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Tridax L.

(Heliantheae)

Wild: 10 (1967); Karis & Ryding: 609 (1994).

Sthn trop. Afr. 1: **Tridax procumbens* L., introduced in Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ursinia Gaertn.

(Anthemideae)

Prassler: 363 (1967); Bremer & Humphries: 93 (1993); Bremer: 451 (1994); Mapaura (Unpublished).

Sthn trop. Afr. 2, Zimbabwe, Mozambique, and sthn Afr.

*Verbesina L.

(Heliantheae)

Wild: 61 (1967).

Sthn trop. Afr. 1: **Verbesina encelioides* (Cav.) A.Gray, Zimbabwe, Mozambique, and sthn Afr.

Vernonia Schreb.

(Vernonieae)

Moore: 44 (1927); Mendonça: 5 (1943); Wild: 31 (1978); Pope: 57 (1992); Jeffrey & Beentje: 159 (2000); White *et al.*: 207 (2001); Bingham & Smith: 140 (2002); Coates Palgrave: 1132 (2002); Mapaura & Timberlake: 163 (2002). *Herderia* Cass. (1829) in part; Mendonça: 37 (1943). *Triplotaxis* Hutch.; Wild & Pope: 359 (1977b).

Sthn trop. Afr. ± 160, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Welwitschiella O.Hoffm.

(Helenieae)

Hoffmann: 390 (1894); Mendonça: 107 (1943); Pope: 103 (1975); Karis & Ryding: 541 (1994).

Perennial herbs. **Leaves** alternate, simple. **Capitula** disciform, paniculate. **Involucral bracts** in 4 or 5 rows. **Receptacle** honeycombed with toothed margins to the pits. **Florets**: marginal ones female, 4-lobed, yellow; disc florets functionally male. **Cypselas**: ray cypselas narrowly obconic, 2- to 6-ribbed. **Pappus** in marginal cypselas of 2–5 irregularly toothed scales.

Monotypic: *Welwitschiella neriifolia* O.Hoffm., Angola, Zambia.

*Xanthium L.

(Heliantheae)

Wild: 3 (1967).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

*Zinnia L.

(Heliantheae)

Wild: 54 (1967); Hilliard: 299 (1977); Karis & Ryding: 588 (1994).

Sthn trop. Afr. 1: **Zinnia peruviana* (L.) L., Zimbabwe, and sthn Afr.

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Avicenniaceae
(Asteridae—Lamiales)
(Euasterids I—Lamiales; included in Acanthaceae)

Retief, E. in Leistner: 171 (2000).

Sthn trop. Afr.: genus 1, species 2.

Avicennia L.

Good & Exell: 146 (1930/1931); Stearn: 34 (1958); Villiers: 59 (1975); Tomlinson: 186 (1986); Verdcourt: 144 (1992) under Verbenaceae; Coates Palgrave: 975 (2002).

Sthn trop. Afr. 2, Angola, Mozambique, and sthn Afr.

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Balanitaceae
(Rosidae—Sapindales)
(Eurosids I; included in Zygophyllaceae)

Archer, R.H. in Leistner: 171 (2000).

Sthn trop. Afr.: genus 1, species 5.

Balanites Delile

Exell & Mendonça: 282 (1951); Launert: 221 (1963); Launert & Paiva: 1 (1969); Sands: 12 (2001); Coates Palgrave: 406 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Balanophoraceae
(Rosidae—Santalales)
(Unplaced)

Jordaan, M. in Leistner: 172 (2000).

Sthn trop. Afr.: genera 2, species 2.

Identification of additional genus using the key in the above reference: **Thonningia** differs from *Sarcophyte* in having a spadix-like, unbranched inflorescence and a style.

Sarcophyte Sparrm.

Hansen: 364 (1986); Hansen: 1 (1993).

Monotypic: *Sarcophyte sanguinea* Sparrm., tropical E and S Africa, with 2 subspecies, both in sthn trop. Afr., Zambia, Malawi, Mozambique, and sthn Africa.

Thonningia Vahl

Vahl: 124 (1810); Hansen: 367 (1986); Hansen: 3 (1993).

Dioecious, fleshy, crimson to pink, later brownish root parasite arising from an underground tuber; tuber rhizome-like, cylindric, branched, swollen at point of contact with host root. **Stem** densely covered with many spirally arranged, triangular-lanceolate scale leaves; flowering stems breaking through buds on tuber leaving a short-lobed volva at base. **Inflorescence** unbranched, spadix-like with obconic terminally obtuse axis bearing many flowers at apex. **Male flowers** pedicellate; perianth segments 2–6, spirally arranged, linear; anthers 3–6, linear-elongate, united but apices free, 2-thecous, dehiscing extrorsely. **Female flowers** densely crowded, linear-prismatic; perianth tubular, obscurely 2- or 3-lobed; style 1, exserted. **Infructescence** a swollen hemisphere, bearing minute, 1-seeded achenes.

Monotypic: *Thonningia sanguinea* Vahl, trop. Africa; sthn trop. Afr.: N Angola, Zambia.

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Balsaminaceae
(Rosidae—Geraniales)
(Asterids—Ericales)

Archer, R.H. in Leistner: 173 (2000).

Sthn trop. Afr.: genus 1, species ± 25.

Impatiens L.

Schulze: 155 (1956); Launert: 162 (1963); Launert & Gonçalves: 2 (1969); Grey-Wilson: 77 (1980); Izidine & Bandeira: 49 (2002); Msekandiana & Mlangeni: 35 (2002); Lebrun & Stork: 338 (2003).

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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SCHULZE, G.M. 1956. Balsaminaceae. *Conspectus florae angolensis* 2: 155–162.

Basellaceae
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Jordaan, M. in Leistner: 173 (2000).

Sthn trop. Afr.: genus 1, species 2.

Basella L.

Verdcourt: 1 (1968); Stannard: 161 (1988).

Sthn trop. Afr. 2, Angola, Zambia, Malawi, Mozambique, and sthn Afr.

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STANNARD, B.L. 1988. Basellaceae. *Flora zambesiaca* 9(1): 161–163.

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Begoniaceae
(Dilleniidae—Violales)
(Eurosids I—Cucurbitales)

Bredenkamp, C.L. in Leistner: 174 (2000).

Sthn trop. Afr.: genus 1, species 23.

Begonia L.

Fernandes: 289 (1970); Kupicha: 499 (1978); De Wilde: 1 (1984); De Lange & Bouman: 1 (1992); Klazenga *et al.*: 263 (1994); De Wilde: 13 (2002).

Sthn trop Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Berberidaceae

(Magnoliidae—Ranunculales)
(Eudicots—Ranunculales)

Shrubs, glabrous; branches with 3-partite spines, and short axillary shoots bearing leaves. **Leaves** alternate, usually clustered, sessile, apparently simple but 3-foliolate with a normal terminal leaflet articulated at its base; petiole short, bearing 2 short, subulate leaflets at its apex; lamina of terminal leaflet coriaceous with prickly dentate to entire margin, and midrib produced as a short prickle; petioles and lateral leaflets usually persistent; stipules 0. **Flowers** bisexual, regular, in axillary racemes or little-branched panicles, yellow, sometimes tinged red; bracts small, lanceolate-acuminate. **Perianth**: segments free, in 5 series of 3: 9 outer ones regarded as **sepals**, increasing in size towards centre, 6 inner ones as **petals** (?staminodes), imbricate, each with 2 linear glands near base; petals smaller than inner sepals. **Stamens** 6, opposite petals, free; filaments stout; anthers 2-thecous, opening by 2 wing-like apical valves. **Ovary** superior, 1-locular, with few, usually 4, basal, ascending anatropous, bitegmic ovules; stigma broad, capitate, subsessile. **Fruit** an ellipsoid berry with persistent stigma. **Seeds** 1–4, rugulose; endosperm abundant; embryo small.

Genera 15, species 680, north temperate to tropical mountains; sthn trop. Afr.: genus 1, species 1.

Jussieu: 286 (1789); Polhill: 1 (1966); Burger: 78 (1967); Loconte: 147 (1993); Mabberley: 83 (1997); Takhtajan: 90 (1997).

Berberis L.

Linnaeus: 330 (1753); Wild: 171 (1960); Polhill: 1 (1966); Phiri (Unpublished).

Description as for family.

Species ± 500, mostly Eurasia, North Africa, trop. African mountains and the Americas; sthn trop. Afr. 1: *Berberis holstii* Engl., Zambia, Malawi.

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POLHILL, R. 1966. *Flora of tropical east Africa.* Berberidaceae: 1–4.

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WILD, H. 1960. Berberidaceae. *Flora zambesiaca* 1(1): 171–173.

Bignoniaceae

(Asteridae—Scrophulariales)
(Euasterids I—Lamiales)

Smithies, S.J. in Leistner: 175 (2000).

Sthn trop. Afr.: genera 10, species 17.

Key to genera

1a Flowers in pendulous lax panicles, up to 1(1.5) m long; fruit fibrous-fleshy, sausage-shaped, up to 1 m long, indehiscent; seeds not winged; ovary 1-locular ..... **Kigelia**

1b Flowers in erect and shorter panicles or racemes or fasciculate or solitary; fruit capsular; seeds winged; ovary 2-locular:

2a Calyx spathe-like; leaves imparipinnate:

3a Corolla tube ± 50 mm long, narrowly cylindric, expanding in the throat; corolla white (in Africa only along the S Mozambican coast) ..... **Dolichandrone**

3b Corolla tube shorter, campanulate; corolla yellow or greenish yellow, mottled brownish purple ..... **Markhamia**

2b Calyx lobed or toothed, not spathe-like; leaves imparipinnate, or 1-jugate or simple:

4a Leaves simple, greyish woolly; corolla white, or whitish pink with a long cylindric tube 40–80 mm long; capsule woody with warted valves ..... **Catophractes**

4b Leaves imparipinnate, 1-jugate or simple; corolla, if white (*Rhigozum*), with a cylindric tube shorter than 20 mm; capsule neither woody nor warted:

5a Capsule cylindric; corolla pale pink or orange to crimson with a yellow throat; leaves appearing after the leaves:

6a Corolla 35–55 mm long, pinkish; flowers in large, terminal, pubescent panicles ..... **Stereospermum**

6b Corolla ± 80 mm long, orange to crimson with a yellow throat; flowers in short, glabrous, axillary racemes ..... **Fernandoa**

5b Capsule compressed; corolla of different colour; leaves and flowers borne at the same time:

7a Leaves short, up to 50 mm long, simple, 1-jugate or imparipinnate, clustered on cushions, perfect stamens 5; corolla deep yellow, pink or white; spiny shrubs or small trees ..... **Rhigozum**

7b Leaves large, 130–330 mm long, imparipinnate; perfect stamens 4; corolla orange to scarlet or lavender; shrubs or small trees, not spiny:
8a Corolla tube curved, narrowly funnel-shaped; stamens exserted; capsule usually 60–120 mm long ..... **Tecomaria**
8b Corolla tube straight, cylindric below, campanulate above; stamens included:
9a Calyx inflated; scrambling shrubs or subshrubs; flowers pink or lilac ..... **Podranea**
9b Calyx not inflated; if shrub then not scrambling; flowers yellow with red lines in the throat ..... ***Tecoma**

Catophractes D.Don

Diniz: 70 (1988); Diniz: 17 (1993); Coates Palgrave: 1009 (2002).

Monotypic genus: *Catophractes alexandri* D.Don, Angola, Zimbabwe, and sthn Afr.

Dolichandrone (Fenzl) Seem.

Seemann: 31 (1862) conserved name; Diniz: 72 (1988); Diniz: 15 (1990); Coates Palgrave: 1010 (2002); Izidine & Bandeira: 49 (2002).

Unarmed shrubs or trees. **Leaves** opposite, imparipinnate, deciduous. **Flowers** borne in terminal panicles, racemes or racemose panicles, fragrant, opening during night. **Calyx** spathaceously splitting along posterior side, beaked at apex. **Corolla** campanulate; tube narrowly cylindric, long, exceeding calyx; lobes 5, subequal, wavy at margin. **Stamens** 4, didynamous; anthers included, introrse, glabrous; staminode present, very small. **Disc** annular, thick. **Ovary** oblong, cylindric, 2-locular; ovules many, pluriseriate. **Capsule** narrowly linear in outline, terete or compressed parallel to false septum, straight or curved, bivalved, loculicidally dehiscent. **Seeds** flat, winged, 1–several on each side of wing.

Species ± 8, tropical Asia, Australia, Africa; sthn trop. Afr. 1: *Dolichandrone alba* (Sim) Sprague, known only from S Mozambique.

Fernandoa Welw. ex Seem.

Seemann: 330 (1865) as *Ferdinandia*; Diniz: 81 (1988); Diniz: 28 (1990); Diniz: 26 (1993); Bidgood: 381 (1994); Coates Palgrave: 1013 (2002); Mapaura & Timberlake: 163 (2002).

Shrubs or trees. **Leaves** opposite, imparipinnate, frequently absent at flowering time. **Flowers** large, in short, few-flowered racemes or solitary, borne praecociously and in axils of fallen leaves. **Calyx** campanulate, irregularly 3–5-lobed, opening just before corolla anthesis. **Corolla** large, showy, brownish red to orange-red or yellow, broadly cup-shaped; tube short, narrowing abruptly into calyx; limb slightly bilabiate. **Stamens** 4, slightly exserted; staminode 1; thecae divaricate. **Disc** cupular. **Ovary** cylindric, narrow, bilocular; ovules pluriseriate in each locule. **Capsule** subcylindric, dehiscing at right angles to the thin flat septum. **Seeds** many, compressed, with hyaline wings.

Species 8, 3 from Madagascar, 5 from African mainland; sthn trop. Afr. 3, Angola, Zimbabwe, Malawi, Mozambique.

Kigelia DC.

White: 379 (1962); Diniz: 83 (1988); Diniz: 31 (1990); Diniz: 29 (1993); Coates Palgrave: 1013 (2002); Houghton: 14 (2002).

Monotypic genus: *Kigelia africana* (Lam.) Benth., trop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Markhamia Seem. ex Baill.

White: 379 (1962); Diniz: 72 (1988); Diniz: 18 (1990); Diniz: 21 (1993); Coates Palgrave: 1011 (2002).

Muenteria Seem.: 329 (1865).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Podranea Sprague

Diniz: 79 (1988); Diniz: 26 (1990); Coates Palgrave: 1007 (2002).

Sthn trop. Afr. 1: *Podranea brycei* (N.E.Br.) Sprague, Zimbabwe, Malawi, Mozambique. Genus also present in sthn Afr.

Rhigozum Burch.

Giess: 31 (1968); Diniz: 67 (1988); Diniz: 13 (1990); Diniz: 13 (1993); Coates Palgrave: 1008 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Stereospermum Cham.

Chamisso: 720 (1833); White: 379 (1962); Diniz: 77 (1988); Diniz: 23 (1990); Diniz: 26 (1993); Coates Palgrave: 1012 (2002).

Glabrous or pubescent trees or shrubs. **Leaves** opposite, imparipinnate. **Inflorescence** terminal, many-flowered, large panicles. **Calyx** campanulate or tubular, irregularly 2–5-lobed. **Corolla** slightly irregular, pink; tube infundibuliform; lobes patent. **Stamens** 4, didynamous, arising in corolla tube, included; anther thecae divergent; staminode 1, ± developed. **Disc** entire or 5-lobed. **Ovary** bilocular, linear-oblong, 4-angled. **Ovules** many, 2-seriate. **Capsule** linear-cylindric. **Seeds** many, winged, rectangular in outline, arranged alternately along both sides of septum.

Species 15, Old World tropics; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

***Tecoma** Juss.

Diniz: 61 (1988); Diniz: 4 (1990); Brummitt: 421 (1992); Mabberley: 702 (1997); Bingham (Unpublished).

**Tecoma stans* (L.) Juss. ex Kunth from C and S America is widely cultivated, and may become invasive. Also present in sthn Afr.

Tecomaria (Endl.) Spach

Spach: 137 (1840); White: 380 (1962); Diniz: 64 (1988); Diniz: 9 (1990); Diniz: 13 (1993); Bingham (Unpublished); Coates Palgrave: 1007 (2002); Phiri (Unpublished).

Straggling, many-stemmed shrubs with scandent branches, or small trees. **Leaves** opposite, imparipinnate; rachis narrowly winged; leaflets 2–6-jugate, ovate to elliptic. **Flowers** in terminal racemes or racemose panicles. **Calyx** campanulate, 5-lobed ± to middle of tube; lobes broadly triangular. **Corolla**: tube narrowly funnel-shaped, almost cylindric, curved; corolla limb bilabiate, 5-lobed, orange to scarlet. **Stamens** didynamous, exserted; filaments adnate to corolla up to about

middle of tube, pubescent-glandular at base; thecae connate in upper third, slightly divergent below. **Disc** cupular. **Ovary** bilocular; ovules many, 4-seriate in each locule. **Capsule** linear-oblong in outline, compressed, dehiscing at right angles to septum. **Seeds** with membranous wings, ± rectangular in outline.

Monotypic genus: *Tecomaria capensis* (Thunb.) Spach, sthn trop. and sthn Afr.; 2 subspecies occur in the region: subsp. *capensis* in Mozambique, and subsp. *nyassae* (Oliv.) Brummitt in NE Angola, Zambia, Malawi, Mozambique and sthn Afr.; subsp. *capensis* is widely cultivated as ornamental in the tropics and subtropics.

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*Bixaceae

(Dilleniidae—Malvales)
(Eurosids II—Malvales)

Shrubs or small trees with reddish to orange juice; branches and rachis of inflorescence covered with rusty scales. **Leaves** alternate, simple, ovate, entire, 5-nerved from base; petioles long, erect, with pulvinus at apex and base; stipules paired, very soon caducous leaving a horseshoe-shaped scale-like scar with a sessile gland on either side of petiole base. **Flowers** bisexual, regular, in terminal panicles or corymbs; pedicels with 5 or 6 apical glands. **Sepals** 4 or 5, free, imbricate in bud, caducous. **Petals** 4–7, free, imbricate in bud, unequal. **Stamens** many, arising on an annular disc; filaments free; anthers 2-thecous, horseshoe-shaped, opening by pore-like slits. **Ovary** superior, 1-locular, usually bristly; ovules many, anatropous, bitegmic, on 2 parietal placentas; style 1; stigma very shortly 2-lobed. **Fruit** a 2(3)-valved, loculicidal capsule with dense, stiff, slender bristles; valves thick, with placenta in middle. **Seeds** many; testa covered with minute, red, sessile glands; embryo large, embedded in copious starchy endosperm.

Genera 3, species 16, pantropical; sthn trop. Afr.: genus 1, species 1, cultivated.

Link: 371 (1831); Exell & Mendonça: 382 (1937 & 1951); Wild: 260 (1960); Bridson: 1 (1975); Wild & Vidigal: 1 (1993); Mabberley: 89 (1997).

*Bixa L.

Linnaeus: 512 (1753); Exell & Mendonça: 77 (1937/1951); Wild: 261 (1960); White: 263 (1962); Bridson: 1 (1975); Villiers: 63 (1975); Wild & Vidigal: 7 (1993).

Description as for family.

Monotypic genus: **Bixa orellana* L., ornamental shrub and hedge plant, native to tropical America, widely cultivated in warmer parts of Africa, and recorded as naturalised in Angola, Zimbabwe and Mozambique.

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Boraginaceae

(Asteridae—Lamiales)
(Euasterids I)

Retief, E. in Leistner: 178 (2000).

Sthn trop. Afr.: genera 11, species 63.

Key to genera

[adapted from Martins (1990)]

1a Trees or shrubs; style terminal:
2a Fruit dry, divisible into two 2-seeded mericarps; style almost absent; stigma 1, ring-like, subterminal ..... **Argusia**
2b Fruit fleshy; style well-developed; stigmas 2 or 4, or 1 bilobed, not as above:
3a Style with each branch again divided; stigmas 4, slender or clavate ..... **Cordia**
3b Style cleft or subentire; stigmas 2, subcapitate or peltate, or 1 bilobed:
4a Calyx shortly lobed or dentate; corolla lobes rounded; endocarp with thin longitudinal lamellas ..... **Bourreria**
4b Calyx lobed to near base; corolla lobes oblong or lanceolate; endocarp with small surface cavities ..... **Ehretia**
1b Herbs or subshrubs; style terminal or gynobasic:
5a Ovary entire or subentire; style terminal:
6a Styles 2; stigmas capitate; flowers 4-merous, solitary, extra-axillary ..... **Coldenia**
6b Style 1; stigma ring-like below the apex of the style; flowers 5-merous, in scorpioid spikes or solitary ..... **Heliotropium**
5b Ovary deeply lobed; style gynobasic:
7a Corolla throat naked:
8a Flowers irregular; anthers without prolonged connectives ..... ***Echium**
8b Flowers regular; connectives prolonged above the anthers by lamellate appendages:
9a Appendages of the anthers twisted; gynobase pyramidal; calyx strongly accrescent in fruit ..... **Trichodesma**
9b Appendages of the anthers straight; gynobase flat; calyx not or only slightly accrescent in fruit ..... **Cystostemon**
7b Corolla throat with folds or fornices:
10a Nutlets ovoid (circular in cross section) erect, smooth, attached to the gynobase by the base; cymes conspicuously bracteate ... **Lithospermum**
10b Nutlets ovoid-depressed (elliptic in cross section), covered with glochidiate spines, attached to the gynobase by the upper part; cymes not bracteate ..... **Cynoglossum**

Argusia Boehm.

Boehmer: 507 (1760); Martins: 81 (1990); Martins: 44 (1993b).

Small trees, shrubs or perennial herbs. **Leaves** entire, sessile or shortly petiolate. **Inflorescence** of scorpioid ebracteate cymes arranged in terminal corymbs or panicles. **Flowers** 5-merous, sessile or pedicellate. **Calyx** 5-lobed almost to base. **Corolla** regular, infundibuliform or hypocrateriform; limb deeply 5-lobed. **Stamens** included, sometimes reaching as far as throat or a little further, free. **Nectary** absent or minute. **Ovary** 4-locular; ovules solitary, pendulous; style terminal; stigmatic ring topped by an entire to 2-lobed stigmatic appendix. **Fruit** dry, dividing at maturity into two 2-seeded, corky mericarps; the 2 fertile cells of each mericarp separated by a deep groove or a sterile cavity.

Species ± 5, America, West Indies, Europe, temperate Asia; sthn trop. Afr. 1: *Argusia argentea* (L.f.) Heine, Mozambique.

Bourreria P.Browne

Browne: 168 (1756); Martins: 72 (1990); Martins: 30 (1993b).

Trees or shrubs. **Leaves** alternate, sometimes crowded, petiolate, simple, usually entire. **Inflorescences** paniculate or corymbose, sometimes few-flowered, terminal but sometimes apparently lateral. **Flowers** bisexual, regular, subsessile or pedicellate. **Calyx** campanulate, closed in bud, 2–5-lobed. **Corolla**: tube usually campanulate; lobes 5, frequently rounded, spreading or reflexed. **Stamens** 5, arising on corolla tube, included or exserted; anthers oblong, on short filaments. **Ovary** 2(4)-locular, conical; style terminal on ovary, entire or very shortly bifid; stigmas 2, capitate or peltate, or 1, bilobed. **Fruit** drupaceous, subglobose; pyrenes 4, bilocular, 1-seeded, outer surface with thin woody lamellas.

Species ± 50, mostly in Central America and West Indies, 5 in Africa; sthn trop. Afr. 2, Mozambique.

Coldenia L.

Linnaeus: 125 (1753); Good: 107 (1929); Taton: 25 (1971); Martins: 79 (1990); Martins: 42 (1993b).

Annual herbs; stems usually procumbent, branched, angular or ± laterally compressed, densely hairy to villous. **Leaves** alternate, usually many, oblong to almost circular, crenate or lobate, subsessile or petiolate. **Flowers** bisexual, 4-merous, solitary, extra-axillary, upper ones on leafy spicate branches. **Calyx** deeply lobed. **Corolla** regular, small, naked. **Stamens** arising below middle of corolla tube, included. **Nectary** absent. **Ovary** 4-locular, with 1 pendulous ovule per locule; styles 2, slightly united below, terminal; stigmas punctate. **Fruit** dry or slightly succulent, ovoid-pyramidal, 4-lobed, usually separating into 4 1-seeded nutlets. **Seeds** ovoid.

Monotypic genus: *Coldenia procumbens* L., occurring in the tropical regions of Africa, Asia and Australia; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Mozambique.

Cordia L.

Good: 106 (1929); Taton: 3 (1971); Martins: 60 (1990); Warfa: 649 (1990); Martins: 6 (1993b); White *et al.*: 173 (2001); Coates Palgrave: 965 (2002).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cynoglossum L.

Good: 108 (1929); Martins: 102 (1990); Martins: 70 (1993b).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cystostemon Balf.f.

Balfour: 82 (1883); Miller & Riedl: 1 (1982); Martins: 99 (1990); Bingham & Smith: 140 (2002).

Vaupelia Brand; Good: 108 (1929); Taton: 46 (1971).

Annual or perennial herbs or subshrubs. **Leaves** alternate, entire. **Inflorescence** a large panicle. **Calyx** 5-lobed, divided almost to base, sometimes accrescent in fruit. **Corolla**: tube short, cylindric or slightly funnel-shaped, without scales in throat; lobes 5, usually much longer than tube. **Stamens** 5, arising on corolla tube; filaments short, oblong, with a basal ciliate or hairy appendage; anthers much longer than filaments, prolonged above thecae by laminar appendages, straight, not twisted, coherent along their margins. **Ovary** 4-lobed; style gynobasic, elongated; stigma capitate, small. **Fruit** of 1–4 nutlets attached to flat gynobase only by the base.

A genus of 13 species, 1 confined to Socotra, 1 in SW Arabian Peninsula, the rest in NE and E Africa, and Zaire; and 4 in sthn trop. Afr.: Angola and Zambia.

*Echium L.

Martins: 59 (1990); Verdcourt: 81 (1991).

Sthn trop. Afr. 1: **Echium plantagineum* L., naturalised in disturbed areas; reported from Angola, Zimbabwe, and sthn Afr.

Ehretia P.Browne

Good: 107 (1929); Taton: 19 (1971); Martins: 75 (1990); Martins: 34 (1993b); Retief & Van Wyk: 9 (2001); White *et al.*: 175 (2001); Coates Palgrave: 971 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Heliotropium L.

Taton: 28 (1971); Martins: 83 (1990); Verdcourt: 50 (1991); Martins: 47 (1993b).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lithospermum L.

Martins: 108 (1990); Verdcourt: 77 (1991).

Sthn trop. Afr. 1: *Lithospermum afromontanum* Weim., Zambia, Zimbabwe, Malawi, and sthn Afr.

Trichodesma R.Br.

Taton: 36 (1971); Brummitt: 429 (1982); Brummitt: 94 (1990); Brummitt & Martins: 61 (1993); Martins: 5 (1993a).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Brassicaceae
(Cruciferae)
(Dilleniidae—Capparales)
(Eurosids II—Brassicales)

Dreyer, L.L. & Jordaan, M. in Leistner: 184 (2000).

Sthn trop. Afr.: genera 11, species 22.

Key to genera

1a Fruit less than 3x as long as broad (a silicule):

2a Fruit with more than 2 seeds, obtriangular ..... ***Capsella**

2b Fruit with 2 seeds, 1 in each locule, elliptic to suborbicular or of 2 suborbicular halves:

3a Fruit dehiscent ..... **Lepidium**
3b Fruit indehiscent, breaking apart along the septum into 2 nutlets ..... ***Coronopus**
1b Fruit at least 3 x as long as broad (a silique):
4a Fruit constricted between the seeds, usually eventually dividing transversely into several joints ..... ***Raphanus**
4b Fruit dehiscing by 2 valves (sometimes tardily):
5a Seeds in 2 rows in each locule:
6a Fruit with a broad, flat, seedless distal beak, valves 1-nerved ..... ***Eruca**
6b Fruit not beaked but with a persistent style ..... **Rorippa**
5b Seeds in 1 row in each locule:
7a Fruit tapered into a distal, sterile or few-seeded beak terminated by the stigma:
8a Fruit 4-angled in cross section, valves keeled ..... **Erucastrum**
8b Fruit ± circular in cross section:
9a Valves of the fruit with 1 conspicuous dorsal vein ..... ***Brassica**
9b Valves of the fruit each with 3 or more veins ..... ***Sinapis**
7b Fruit ± abruptly ending in a thin style:
10a Fruit laterally compressed with flattened valves, dehiscing by the valves coiling explosively from the base ..... **Cardamine**
10b Fruit ± circular in cross section, valves not coiling at dehiscence, with 2 or more parallel nerves ..... ***Sisymbrium**

*Brassica L.

Exell & Mendonça: 51 (1937/1951); Exell: 186 (1960); Exell & Gonçalves: 4 (1973); Kers: 70 (1987).

Sthn trop. Afr. 2, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.; cultivated and naturalised.

*Capsella Medik.

Exell: 192 (1960).

Sthn trop. Afr. 1: **Capsella bursa-pastoris* (L.) Medik., Zimbabwe, and sthn Afr.; weed of cultivation.

Cardamine L.

Exell & Mendonça: 51 (1937/1951); Exell: 189 (1960); Jonsell: 38 (1982).

Sthn trop. Afr. 2: 1 natural, 1 introduced weed, Angola, Zimbabwe, and sthn Afr.

*Coronopus Zinn

Exell: 193 (1960); Exell: 140 (1970); Exell & Gonçalves (1973); Jonsell: 23 (1982); Bingham & Smith: 150 (2002).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

*Eruca Mill.

Exell: 186 (1960).

Sthn trop. Afr. 1: **Eruca sativa* Mill., Zimbabwe, and sthn Afr.; occasional escape from cultivation.

Erucastrum (DC.) C.Presl

Exell: 189 (1960); Jonsell: 9 (1982).

Sthn trop. Afr. 1: *Erucastrum arabicum* Fisch. & C.A.Mey., Zimbabwe, and sthn Afr.

Lepidium L.

Exell & Mendonça: 52 (1937/1951); Exell: 190 (1960); Exell: 140 (1970); Exell & Gonçalves: 6 (1973); Jonsell: 17 (1982); Lebrun & Stork: 164 (2003).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

*Raphanus L.

Exell & Mendonça: 52 (1937/1951); Exell: 193 (1960); Kers: 73 (1987).

Sthn trop. Afr. 2, Angola, Zimbabwe, and sthn Afr.; cultivated and potential escapes.

Rorippa Scop.

Exell & Mendonça: 50 (1937/1951); Exell: 182 (1960); Exell: 139 (1970); Exell & Gonçalves: 1 (1973); Jonsell: 52 (1982); Kers: 77 (1987); Lebrun & Stork: 166 (2003).

Nasturtium R.Br.; Exell & Mendonça: 49 (1937/1951).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Sinapis L.

Exell: 188 (1960).

Sthn trop. Afr. 1: **Sinapis arvensis* L., Zimbabwe, and sthn Afr.

*Sisymbrium L.

Exell: 188 (1960).

Sthn trop. Afr. 1: **Sisymbrium orientale* L., Zambia, Zimbabwe, and sthn Afr.; weed of cultivation.

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Brexiaceae

(Rosidae—Rosales; under Grossulariaceae)
(Eurosids I—Celastrales; included in Celastraceae)

Shrubs or small trees, evergreen, glabrous. **Leaves** alternate, simple, ± entire, petiolate; stipules minute, caducous. **Flowers** bisexual, regular, in axillary cymes, false umbels or fascicles, sometimes cauliflorous, rarely single. **Sepals** (4)5, free, imbricate, deciduous. **Petals** (4)5, free, imbricate, deciduous. **Disc** (4)5-lobed, lobes alternating with stamens and each lobe bearing 3 or 4(–6) stiff (?)staminodes. **Stamens** (4)5, slightly perigynous, arising between and united with disc lobes; filaments dorsally compressed and slightly dilated near base; anthers 2-thecous, versatile, introrse. **Ovary** superior, 5(6 or 7)-locular, usually 5-angled; ovules many in each locule, on axile placentas, anatropous, unitegmic. **Fruit** drupaceous, usually 5-locular and 5-ribbed; mesocarp woody at first, but said to become pulpy at length and edible. **Seeds** many, irregularly compressed-ellipsoid, carinate, minutely rugulose in ridges; endosperm sparse; embryo as long as seed.

Genera 3, species 3, or ± 8, East Africa, Madagascar, Mascarenes, Seychelles; sthn trop. Afr. genus 1, species 1.

Loudon: 524 (1830); Robson: 59 (1978); Takhtajan: 343 (1997).

Brexia Noronha ex Thouars

Thouars: 20 (1806) name conserved; Verdcourt: 1 (1968); Robson: 59 (1978); Coates Palgrave: 240 (2002) under Escalloniaceae.

Description as for family.

Species 1, very variable or ± 6 very closely related ones, Tanzania (including Zanzibar), Madagascar, Comoro Islands, Seychelles; sthn trop. Afr. 1: *Brexia madagascariensis* (Lam.) Ker Gawl., Mozambique.

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Buddlejaceae

(formerly usually included in Loganiaceae)
(Asteridae—Gentianales)
(Euasterids I—Lamiales; included in Scrophulariaceae)

Victor, J.E. in Leistner: 195 (2000).

Sthn trop. Afr.: genera 3, species 11.

Buddleja L.

Leeuwenberg: 1 (1979); Leeuwenberg: 333 (1983) under Loganiaceae; White *et al.*: 336 (2001) under Loganiaceae; Coates Palgrave: 936 (2002).

Sthn trop. Afr. 7 indigenous, a few others cultivated and of these at least *Buddleja madagascariensis* Lam. often naturalised, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gomphostigma Turcz.

Leeuwenberg: 15 (1977) under Loganiaceae; Leeuwenberg: 343 (1983) under Loganiaceae; Coates Palgrave: 936 (2002).

Sthn trop. Afr. 1: *Gomphostigma virgatum* (L.f.) Baill., Angola, Zambia, Zimbabwe, and sthn Afr.

Nuxia Comm. ex Lam.

Exell *et al.*: 101 (1929) under Loganiaceae; Leeuwenberg: 349 (1983) under Loganiaceae; White *et al.*: 340 (2001); Coates Palgrave: 933 (2002).

Lachnopylis Hochst.; White: 339 (1962) as synonym.

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Burseraceae
(Rosidae—Sapindales)
(Eurosids II—Sapindales)

Archer, R.H. in Leistner: 196 (2000).

Sthn trop. Afr.: genera 4, species ± 36.

Key to genera

[after Keay (1958) and Troupin (1958)]

1a Sepals and petals 4; stamens 8; receptacle concave; leaves simple, 3-foliolate or imparipinnate; leaflets often toothed ..... **Commiphora**
1b Sepals and petals 3; stamens 6; receptacle flat or convex; leaves imparipinnate; leaflets entire:
2a Fruit flattened, irregularly globose to ellipsoid; style lateral; ovary 3-locular; inflorescence glabrous ..... **Santiria**
2b Fruit not flattened, symmetric, ovoid to subglobose; style terminal; ovary 2- or 3-locular; inflorescence pubescent:
3a Sepals free or basally united; indumentum of stellate and simple hairs; ovary 2(3)-locular, locules not separated by an axial intrusion .... **Dacryodes**
3b Sepals largely united; indumentum of simple hairs; ovary 3-locular, locules separated by a 3-winged axial intrusion and covered by mesocarpal lids forming a 3-gonous, spindle-shaped "stone" in fruit ..... **Canarium**

Canarium L.

Linnaeus: 121 (1759); White: 173 (1962); Exell & Mendonça: 305 (1963); Wild: 283 (1963); Gillett: 1 (1991).

Dioecious trees. **Leaves** imparipinnate; leaflets in up to ± 24 pairs, usually entire. **Inflorescences** of axillary paniculate cymes; peduncle usually elongated; cymules surrounded by persistent or caducous bracts. **Flowers** unisexual. **Calyx** infundibuliform, campanulate or saucer-shaped; lobes 3. **Petals** 3, usually imbricate below but valvate towards apex. **Stamens** 6, free or connate below, inserted on or outside disc or sometimes, in male flowers, inserted on disc which then resembles an androphore, smaller and infertile in female flowers. **Disc** variable in form, sometimes pubescent. **Ovary** (absent or vestigial in male flowers) 3-locular, locules 2-ovulate; style ± elongated; stigma subcapitate, ± 3-lobed. **Fruit** a drupe; pericarp fleshy; endocarp crustaceous, ± trigonous, 3-locular with 3 seeds, or 2 locules sometimes abortive. **Seed** with 3-foliolate or palmatifid, plicate or conduplicate cotyledons.

Species 77, mostly trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Mozambique.

Commiphora Jacq.

Exell & Mendonça: 298 (1951); White: 173 (1962); Wild: 263 (1963); Mendes: 137 (1964); Mendes: 295 (1970); Gillett: 8 (1991); White *et al.*: 176 (2001); Coates Palgrave: 425 (2002); Mapaura & Timberlake: 163 (2002).

Balsamea Gled.; Hiern: 123 (1896).

Sthn trop. Afr. ± 30, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dacryodes Vahl

Vahl: 116 (1810); Wild: 282 (1963); Onana & Cheek: 219 (2003).

Pachylobus G.Don; Exell & Mendonça 1: 304 (1951).

Evergreen dioecious trees; trunk shallowly fluted; bark reddish brown; crown dense, much branched; young branches, branches of inflorescence, calyx and corolla with a dense indumentum of ferruginous stellate or dendroid hairs. **Leaves** imparipinnate; leaflets 5–8-jugate, oblong-lanceolate to ovate-lanceolate, entire. **Inflorescences** of axillary or terminal, elongated panicles. **Flowers** unisexual. **Calyx** 3-lobed, rotate or broadly campanulate, divided almost to base, lobes valvate. **Petals** 3, valvate or sometimes slightly imbricate, incurved, somewhat hooded and usually mucronulate at apex. **Stamens** 6, inserted just outside disc, equal in size, with filaments broader towards base (smaller and infertile in female flowers). **Disc** annular but slightly lobed between stamens. **Ovary** (vestigial in male flowers) 2(3)-locular with 2 ovules per locule; style very short; stigma 3- or 4-lobed. **Fruit** an ovoid or ellipsoid drupe; endocarp thin and cartilaginous. **Seed** large; cotyledons very much thickened and deeply folded or conduplicate, thus appearing palmately lobed.

Species 40, tropical Old and New World; sthn trop. Afr. 2, Angola, Zambia.

Santiria Blume

Blume: 209 (1850); Troupin: 136 (1958).

Santiriopsis Engl.; Exell & Mendonça: 303 (1951).

Dioecious, or sometimes monoecious trees; branches usually with resin ducts. **Leaves** imparipinnate; leaflets 7 or 9, entire, with short petiolules; stipules absent. **Inflorescences** paniculate or racemose, usually axillary, glabrous; bracts ovate. **Male flowers** with sepals 3, free or united and then forming a subtruncate calyx; petals 3, free, valvate, thick, with inflexed apex; stamens 6, filaments short, anthers basi- or dorsifixed, dehiscing longitudinally. **Disc** intrastaminal, cupuliform to annular. **Female flowers**: sepals and petals as in male flowers; ovary 3-locular, 1 locule sometimes sterile; stigma sessile, 3-lobed. **Fruit** a drupe, ± obliquely globose to ellipsoid; stigma excentric, sometimes lateral and situated close to pedicel. **Seeds** rounded; cotyledons divided and conduplicate.

Species 24, Oceania and trop. Africa; sthn trop. Afr. 2, Angola.

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Buxaceae
(Dilleniidae—Buxales)
(Eudicots)

Archer, R.H. in Leistner: 196 (2000).

Sthn trop. Afr.: genus 1, species 2.

Buxus L.

Hutchinson: 108 (1967); Friis: 293 (1989); Glen: 37 (1996); White *et al.*: 177 (2001); Coates Palgrave: 536 (2002); Msekandiana & Mlangeni: 35 (2002).

Notobuxus Oliv.: t. 1400 (1882); Hutchinson: 375 (1915) as Euphorbiaceae.

Sthn trop. Afr. 2, Malawi, Mozambique, and sthn Afr.

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Cabombaceae
(Magnoliidae—Nymphaeales)
(Basal families; included in Nymphaeaceae)

Glen, R.P. in Leistner: 197 (2000).

Sthn trop. Afr.: genus 1, species 1.

Brasenia Schreb.

Exell & Mendonça: 45 (1937/1951); Wild: 173 (1960); Exell: 139 (1970).

Sthn trop. Afr. 1: *Brasenia schreberi* J.F.Gmel., Angola, Zambia, Zimbabwe, and sthn Afr.

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Cactaceae
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Glen, H.F. in Leistner: 197 (2000).
Gonçalves: 301 (1970); Gonçalves: 506 (1978).

Sthn trop. Afr.: genera 4, species ?8.

*Cereus Mill.

Henderson: 84 (2001).

*_Cereus jamacaru_ DC., a declared weed in South Africa, is certain to be an invader, at least in Zimbabwe, judging by its distribution in South Africa [see Henderson (2001)].

*Opuntia Mill.

Gossweiler & Mendonça: 202 (1939); Gonçalves: 506 (1978); Gonçalves: 1 (1979); Henderson: 87 (2001); Mapaura (Unpublished).

Several species have become naturalised in Africa, including sthn Afr.; judging by the distribution pattern of species in South Africa [Henderson (2001)], 5 or more species occur at least in Zimbabwe.

*Pereskia Mill.

Gonçalves: 506 (1978); Gonçalves: 1 (1979); Henderson: 77 (2001).

*_Pereskia aculeata_ Mill., naturalised in Africa, including sthn Afr.

Rhipsalis Gaertn.

Gonçalves: 301 (1970); Gonçalves: 506 (1978); Gonçalves: 1 (1979); Barthlott: 97 (1987); Barthlott & Taylor: 43 (1995); Smith *et al.*: 94 (1999); White *et al.*: 177 (2001).

Sthn trop. Afr. 1: *Rhipsalis baccifera* (J.S.Mill.) Stearn subsp. *mauritiana* (DC.) Barthlott, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Campanulaceae
(including Lobeliaceae)
(Asteridae—Asterales)
(Euasterids II—Asterales)

Welman, W.G. in Leistner: 200 & 339 (Lobeliaceae) (2000).

Sthn trop. Afr.: genera 7, species 73.

Key to genera

1a Flowers irregular, 1- or 2-lipped; anthers cohering in a tube around the style, or ± free (*Cyphia*):
- 2a Anthers ± free: ... **Cyphia**
- 2b Anthers united into a tube:
  - 3a Stigma lobes short and broad, surrounded by a ring of pollen-collecting hairs; bracteoles minute, ± linear, rarely absent ... **Lobelia**
  - 3b Stigma lobes linear, with a ring of pollen-collecting hairs well below them; bracteoles resembling small leaves ... **Monopsis**

1b Flowers regular; anthers free:
- 4a Corolla ± 50 mm long, orange or red; flowers 6-merous; fruit baccate ... **Canarina**
- 4b Corolla shorter than 30 mm, never orange or red; flowers (3–)5-merous; fruit capsular:
  - 5a Capsule indehiscent, tardily opening by the irregular decomposition of the pericarp between the persistent lateral nerves; seeds sometimes with hair-like projections; annuals ... **Gunillaea**
  - 5b Capsule with apical dehiscence; seeds without hair-like projections:
    - 6a Capsule dehiscing by apical valves; annuals or perennials ... **Wahlenbergia**
    - 6b Capsule dehiscing by an apical lid; perennial, often mat-forming herbs ... **Craterocapsa**

Canarina L.

Linnaeus: 148, 588 (1771), name conserved; Binns: 25 (1968); Thulin: 88 (1983).

Glabrous terrestrial or epiphytic perennial herbs containing abundant white latex; stems erect and scandent or pendent, herbaceous, terete and hollow, di- or trichotomously branched from leaf axils; most leaf axils also producing small, usually rudimentary, accessory shoots; roots thickened, fleshy. **Leaves** opposite or ternate, ± triangular to ovate, dentate to serrate, petiolate. **Flowers** solitary in dichasial forks or terminal, large, pendent, (5)6(7)-merous throughout. **Calyx**: tube (hypanthium) obconical, 6-ribbed; lobes entire or sometimes dentate, erect, spreading or reflexed. **Corolla** funnel-shaped or campanulate with short lobes. **Stamens** with bases of filaments broad, shield-like. **Ovary** inferior; style shorter than corolla, markedly thickened towards apex, with short style lobes. **Fruit** baccate, with persistent calyx. **Seeds** many; testa finely pitted or striate.

Species 3, 2 in trop. Africa, 1 on the Canary Islands; the latter, *Canarina canariensis* (L.) Vatke, is a common greenhouse plant; sthn trop. Afr. 1: *Canarina eminii* Aschers. ex Schweinf., Malawi.

Craterocapsa Hilliard & B.L.Burtt

Thulin: 114 (1983).

Sthn trop. Afr. 1: *Craterocapsa tarsodes* Hilliard & B.L.Burtt, Zimbabwe, and sthn Afr.

Cyphia P.J.Bergius

Good: 68 (1927); Thulin: 148 (1983); Msekandiana & Mlangeni: 36 (2002) under Lobeliaceae.

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gunillaea Thulin

Thulin: 165 (1974); Thulin: 111 (1983); Phiri (Unpublished) as *Gunilaea*.

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lobelia L.

Binns: 25 (1968); Thulin: 118 (1983); White *et al.*: 178 (2001); Mapaura & Timberlake: 165 (2002) under Lobeliaceae.

Sthn trop. Afr. 31, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Monopsis Salisb.

Thulin: 145 (1983).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Wahlenbergia Schrad. ex Roth

Thulin: 88 (1983).

Cephalostigma A.DC.; Good: 68 (1927); Binns: 25 (1968). *Lightfootia* L'Hér.; Good: 68 (1927); Binns: 25 (1968); Bingham & Smith: 140 (2002).

Sthn trop. Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Canellaceae

(Magnoliidae—Magnoliales)
(Magnoliids—Canellales)

Bredenkamp, C.L. in Leistner: 202 (2000).

Sthn trop. Afr.: genus 1, species 1.

Warburgia Engl.

Verdcourt: 1 (1990); Kubitzki: 200 (1993); White *et al.*: 179 (2001); Coates Palgrave: 741 (2002); Izidine & Bandeira: 49 (2002); Mapaura & Timberlake: 163 (2002); Msekandiana & Mlangeni: 35 (2002).

Species 3, tropical and southern Africa; sthn trop. Afr. 1: *Warburgia salutaris* (Bertol.f.) Chiov., Zimbabwe, Malawi, Mozambique, and sthn Afr.

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*Cannabaceae

(Dilleniidae—Urticales)
(Eurosids I—Rosales)

Jordaan, M. in Leistner: 203 (2000).

Angiosperm Phylogeny Group (2003) include Celtidaceae in this family.

Sthn trop. Afr.: genus 1, species 1.

*Cannabis L.

Wilmot-Dear: 13 (1991); Kubitzki: 205 (1993); Phiri (Unpublished).

**Cannabis sativa* L., a native of Central Asia, widely cultivated and locally naturalised; also in sthn Afr.

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Capparaceae
(Capparidaceae)
(Dilleniidae—Capparidales)
(Eurosids II—Brassicales; included under Brassicaceae)

Dreyer, L.L. & Jordaan, M. in Leistner: 204 (2000).

Sthn trop. Afr.: genera 11, species 87.

Key to genera

1a Herbs; fruit an elongated capsule with 2 valves separating from a persistent replum ..... **Cleome**
1b Woody plants, or if apparently herbaceous, then with a woody rootstock:
2a Androphore elongated, longer than the sepals:
3a Leaves 3-foliolate; androphore with staminodes at its base; fruit globose ..... **Cladostemon**
3b Leaves simple; androphore with a conspicuous nectar gland at its base; fruit cylindric ..... **Cadaba**
2b Androphore short or absent:
4a Calyx rupturing transversely; fruit with 8–10 longitudinal ribs ..... **Thilachium**
4b Calyx not rupturing transversely; fruit not ribbed:
5a Branches with spines derived from stipules ..... **Capparis**
5b Branches without spines:
6a Receptacle tubular to narrowly funnel-shaped:
7a Androphore about as long as the receptacle; sepals spreading; disc present; flowers solitary, fascicled or in terminal racemes or corymbs ..... **Maerua**
7b Androphore very short; calyx lobes not or scarcely spreading; disc absent; flowers in abbreviated racemes on old wood ... **Bachmannia**
6b Receptacle widely cup-shaped to widely funnel-shaped:
8a Petals absent; leaves simple ..... **Boscia**
8b Petals present, at least in male and bisexual flowers; leaves mostly 3–5-foliolate:
9a Petals unequal; upper 2 much larger than lower 2 ..... **Euadenia**
9b Petals ± equal, 4–many:
10a Petals ribbon-like, ± 10 x as long as broad or longer; sepals valvate ..... **Ritchiea**
10b Petals broadly elliptic or ovate; sepals imbricate ..... **Crateva**

Bachmannia Pax

Exell: 140 (1970); Killick: 142 (1970); Wild & Gonçalves: 1 (1973); Coates Palgrave: 221 (2002).

Sthn trop. Afr. 1: *Bachmannia woodii* (Oliv.) Gilg, Mozambique and sthn Afr.

Boscia Lam.

Exell & Mendonça: 64, 359 (1937/1951); Wild: 229 (1960); White: 59 (1962); Wild & Gonçalves: 44 (1973); Coates Palgrave: 224 (2002).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cadaba Forssk.

Exell & Mendonça: 61 (1937/1951); Wild: 207 (1960); White: 60 (1962); Wild & Gonçalves: 14 (1973); Coates Palgrave: 229 (2002); Lebrun & Stork: 126 (2003).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Capparis L.

Exell & Mendonça: 62, 359 (1937/1951); Wild: 235 (1960); White: 61 (1962); Wild & Gonçalves: 53 (1973); Coates Palgrave: 222 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cladostemon A.Braun & Vatke

Wild: 211 (1960); White: 61 (1962); Wild & Gonçalves: 18 (1973); Coates Palgrave: 221 (2002).

Sthn trop. Afr. 1: *Cladostemon kirkii* (Oliv.) Pax & Gilg, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cleome L.

Exell & Mendonça: 53, 359 (1937/1951); Wild: 195 (1960); Wild & Gonçalves: 2 (1973); Msekandiana & Mlangeni: 35 (2002).

Gynandropsis DC.; Exell & Mendonça: 58, 359 (1937/1951); Wild: 205 (1960).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Crateva L.

Linnaeus: 144 (1753); Linnaeus: 203 (1754); Wild: 240 (1960); Lebrun & Stork: 141 (2003).

Shrubs or trees, deciduous, glabrous; bark smooth, brown; young branches with prominent yellowish lenticels. **Leaves** 3-foliolate, petiolate. **Inflorescence** of axillary or terminal, corymbose racemes. **Flowers** bisexual or unisexual by abortion. **Sepals** 4, open in aestivation, arising from a shallow receptacle. **Petals** 4(5), rather large, clawed, white. **Androgynophore** short, dilated. **Stamens** 8–50. **Ovary** ovoid or globose on a long gynophore, 1-locular or 2-locular by intrusion of 2 placentas, multi-ovulate; stigma subsessile. **Fruit** globose or ovoid with a coriaceous pericarp borne on a stout stipe. **Seeds** many, reniform with a coriaceous testa.

Species 6, tropics; sthn trop. Afr. 1: *Crateva adansonii* DC. (= *C. religiosa* G.Forst.), Zambia.

Euadenia Oliv.

Oliver: 969 (1867); Exell: 12 (1935); Exell & Mendonça: 68 (1937/1951); White: 62 (1962); Kers: 34 (1987); Martins: 58 (1994).

Sparsely branched subshrubs, ± glabrous. **Leaves** trifoliolate, long-petiolate; leaflets elliptic to oblong-elliptic with acute to acuminate apex and cuneate base, entire. **Inflorescences** elongate, terminal racemes; floral bracts simple, narrowly lanceolate to subulate. **Flowers** irregular, green. **Sepals** 4, imbricate, free, lanceolate to oblong-lanceolate, 3-nerved, glabrous, caducous. **Petals** 4, free, alternisepalous, in 2 dimorphic pairs: upper pair unguiculate, spathulate, 3 times larger than lower pair. **Stamens** comprising 5 fertile ones with filaments free almost to base, and 4(–7) staminodes with filaments fused into a staminodial column crowned by sterile anthers; androgynophore absent. **Ovary** cylindric, 1-locular, glabrous, on a long gynophore; placentas 2, parietal; ovules many, arranged in 2 rows on each placenta; replum glabrous; stigma ± sessile and capitate. **Fruit** ± cylindric and torulose. **Seeds** many, ± reniform; endosperm absent or scanty; embryo curved.

Species 3, trop. Africa; sthn trop. Afr. 1: *Euadenia brevipetala* Exell, Angola (Cabinda).

Maerua Forssk.

Exell & Mendonça: 59 (1937/1951); Wild: 216 (1960); White: 62 (1962); Wild & Gonçalves: 21 (1973); Bingham & Smith: 140 (2002); Coates Palgrave: 232 (2002); Izidine & Bandeira: 49 (2002); Mapaura & Timberlake: 163 (2002); Lebrun & Stork: 140 (2003).

Courbonia Brongn.; Wild: 214 (1960); White: 62 (1962).

Sthn trop. Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ritchiea R.Br. ex G.Don

Don: 276 (1831) as *Richiea*; Exell & Mendonça: 66 (1937/1951); Wild: 242 (1960); White: 65 (1962); Wild & Gonçalves: 62 (1973); Coates Palgrave: 220 (2002); Lebrun & Stork: 149 (2003).

Shrubs, trees or lianes. **Leaves** alternate or more rarely subverticillate or subopposite; petioles often rather long; blade 3–5-foliolate or by reduction 1-foliolate or simple. **Inflorescence** in terminal or axillary racemes. **Flowers** bisexual. **Sepals** 4, valvate, in a single series arising from a cupular receptacle with margin slightly thickened and annular. **Petals** 4 or many, often longer than sepals. **Androgynophore** very short. **Stamens** 12–many; filaments slender, long, outer ones sometimes sterile and petaloid. **Ovary** borne on a gynophore, 1-locular with 2–4 multi-ovulate placentas; stigma sessile or on a short style. **Fruit** cylindric, ellipsoid or ovoid, with 3–8 coriaceous valves or indehiscent. **Seeds** many, embedded in a fleshy pulp.

Species 30, trop. Africa; sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Mozambique.

Thilachium Lour.

Burtt Davy *et al.*: 39 (1958) as *Thylachium*; Wild: 213 (1960) as *Thylacium*; Wild & Gonçalves: 20 (1973); Coates Palgrave: 237 (2002).

Sthn trop. Afr. 1: *Thilachium africanum* Lour., Zimbabwe, Malawi, Mozambique and sthn Afr.

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Caricaceae

(Dilleniidae—Violales)
(Eurosids II—Brassicales)

Trees or shrubs, usually glabrous, with soft wood and usually unbranched stems with an apical cluster of leaves; monoecious or dioecious, rarely with bisexual flowers; milky latex present in all parts. **Leaves** alternate, large and long-petiolate, ± circular in outline, palmately lobed and -veined; stipule 0. **Flowers** usually unisexual, regular, in axillary inflorescences; male flowers in many-flowered panicles; female flowers solitary or in few-flowered racemes. **Sepals** 5, small, united into a subentire or 5-lobed calyx. **Petals** 5, united into a slender tube in male flowers and a short to very short tube in female flowers. **Stamens** 10 in 2 series of 5, arising on corolla tube, absent in female flowers; filaments free or basally united into a short tube; anthers 2-thecous, introrse, opening by longitudinal slits. **Ovary** superior, of 5 carpels, 1-locular with deeply intrusive parietal placentas, or these meeting to create a 5-locular ovary with placentas on the partitions; ovules many, anatropous, bitegmic, with ± enlarged funicles; style short or absent; stigmas 5, connate at base, entire or lobed; rudimentary ovary with long style sometimes present in male flowers. **Fruit** a large, fleshy, many-seeded berry. **Seeds** with succulent outer sarcotesta and hard endotesta; embryo straight, spatulate; embedded in fleshy endosperm.

Genera 4, species 33, tropics and subtropics of America, with centre in S America, and in trop. Africa; sthn trop. Afr.: genera 2 (1 introduced), species 2 (1 introduced).

Dumortier: 37, 42 (1829); Harms: 510 (1925); Hemsley: 1 (1958); Fernandes: 231, 377 (1970); Kupicha: 412 (1978); Mabberley: 128 (1997); Takhtajan: 209 (1997).

Key to genera

Upper part of trunk and branches armed with prickles; plants monoecious; leaves 3–5-lobed; ovary and fruit 5-locular ..... **Cylicomorpha**
Plants unarmed, usually dioecious; leaves 7–11-lobed; ovary and fruit 1-locular ..... ***Carica**

*Carica L.

Linnaeus: 1036 (1753); Harms: 516 (1925); Hemsley: 1 (1958); White: 269 (1962); Fernandes: 231 (1970); Kupicha: 412 (1978); Scott: 1 (1990).

Trees, usually dioecious, fast-growing, unarmed; trunk usually simple, soft-wooded. **Leaves** clustered at apex of stem and at ends of branches, deeply 7–11-palmatilobed, with lobes ± irregularly and deeply pinnatifid or coarsely toothed. **Male flowers** with small cupuliform calyx with 5 triangular to linear lobes; corolla lobes shorter than tube; filaments free, arising in corolla throat, those of outer series alternipetalous and exserted, those of inner series epipetalous with very short filaments; pistillode acicular. **Female flowers** with cupuliform calyx with short teeth; petals ± free; ovary 1-locular, 5-angular; ovules borne on parietal placenta; stigmas flabellate, fimbriate to deeply, ± dichotomously divided. **Fruit** 1-locular.

Species 23, warm America; sthn trop. Afr. 1: **Carica papaya* L., the widely cultivated pawpaw, sometimes persisting as a relict of cultivation.

Cylicomorpha Urb.

Urban: 115 (1901); Harms: 519 (1925); Hemsley: 1 (1958); Fernandes: 231 (1970); Kupicha: 412 (1978); White *et al.*: 182 (2001).

Monoecious trees; trunk simple or sparsely branched at apex, upper parts and branches armed with short conical prickles. **Leaves** clustered at apex of stem and at ends of branches, shallowly to deeply 3–5-lobed, strongly cordate at base, ± orbicular in outline, lobes entire or with subsidiary lobes. **Male flowers** with calyx ± entire; corolla tube cylindric, lobes shorter than tube; filaments connate into a ring at base. **Female flowers**: calyx ± entire; petals free; androecium entirely absent; stigmas free, connate at base; ovary 5-locular, 5-angled; ovules many, borne in the angle between the septa and the ovary wall. **Fruit** 5-locular.

Species 2, trop. Africa; sthn trop. Afr. 1: *Cylicomorpha parviflora* Urb., Malawi.

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Caryophyllaceae
(including Illecebraceae)
(Caryophyllidae—Caryphyllales)
(Core Eudicots—Caryophyllales)

Jordaan, M. in Leistner: 206 (2000).

Sthn trop. Afr.: genera 12, species 25.

Identification of additional genus: Polytepalum differs from all other local representatives of the family in having ± 20 sepals and more than 10 'petals'.

Cerastium L.

Wild: 346 (1961); Binns: 26 (1968); Lebrun & Stork: 238 (2003).

Sthn trop. Afr. 1: *Cerastium indicum* Wight & Arn., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Corrigiola L.

Wild: 360 (1961); Lebrun & Stork: 240 (2003).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dianthus L.

Exell & Mendonça: 112, 368 (1937/1951); Hooper: 355 (1961); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Mozambique, and sthn Afr.

Drymaria Willd. ex Schult.

Exell & Mendonça: 109 (1937/1951); Wild: 344 (1961); Binns: 26 (1968).

Sthn trop. Afr. 1: *Drymaria cordata* (L.) Willd. ex Roem. & Schult., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Krauseola Pax & K.Hoffm.

Wild: 337 (1961).

Sthn trop. Afr. 1: *Krauseola mosambicina* (Moss) Pax & K.Hoffm., Mozambique, and sthn Afr.

Pollichia Aiton

Wild: 358 (1961).

Sthn trop. Afr. 1: *Pollichia campestris* Ait., Zambia, Zimbabwe, Mozambique, and sthn Afr.

Polycarpaea Lam.

Exell & Mendonça: 110, 368 (1937/1951); Wild: 341 (1961); Binns: 26 (1968); Lebrun & Stork: 246 (2003).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Polycarpon L.

Exell & Mendonça: 110, 368 (1937/1951); Wild: 339 (1961); Binns: 26 (1968).

Sthn trop. Afr. 1: *Polycarpon prostratum* (Forssk.) Aschers. & Schweinf., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Polytepalum Suess. & Beyerle

Suessenguth & Beyerle: 143 (1938); Exell & Mendonça: 368 (1937/1951); Bittrich: 222 (1993).

Erect subshrubs with branched, crisped white hairs. **Leaves** apparently whorled, lanceolate; stipules very small. **Inflorescences** terminal, paniculate, bracteate cymes. **Flowers** bisexual, relatively large; bracteoles 2. **Sepals** ± 19–23, white. **'Petals'** ± 12–15, narrower than sepals, white. **Stamens** ± 13, alternating with ± 13 basal nectary tubercles. **Ovary** superior, 5- or 6-carpellate; style 1; stigmas minute; ovules many. **Fruit** a septicidal, 5- or 6-valved capsule. **Seeds** many, ripe ones unknown.

Monotypic: *Polytepalum angolense* Suess. & Beyerle, known only from Angola.

Silene L.

Exell & Mendonça: 113 (1937/1951); Wild: 350 (1961); Binns: 26 (1968).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Spergula** L.

Exell & Mendonça: 109, 367 (1937/1951); Wild: 346 (1961).

Sthn trop. Afr. 1: **Spergula arvensis* L., Angola, Zimbabwe, and sthn Afr.; introduced weed of cultivation.

Stellaria L.

Exell & Mendonça: 109, (1937/1951); Wild: 349 (1961); Binns: 26 (1968); Phiri (Unpublished).

Sthn trop. Afr.: 2 species indigenous in Zimbabwe, Malawi, and Mozambique; **S. media* (L.) Vill., an introduced cosmopolitan weed of cultivation recorded from Angola, Zimbabwe, and sthn Afr., **S. pallida* (Dumort.) Piré, an introduced weed recorded from Zambia.

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*Casuarinaceae

(Hamamelidae—Casuarinales)
(Eurosids I—Fagales)

Jordaan, M. in Leistner: 213 (2000).

Sthn trop. Afr.: genus 1, species 1.

*Casuarina L.

White: 19 (1962); Wilmot-Dear: 117 (1991); Coates Palgrave: 119 (2002).

Sthn trop. Afr. 1: **Casuarina equisetifolia* L. is either indigenous or of very ancient introduction (fruits ?sca-borne) on the coast of Mozambique and sthn Afr.; several other species are cultivated (Glen 2002), and at least **C. cunninghamiana* Miq. has become naturalised.

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Cecropiaceae

(Hamamelidae—Urticales)
(Eurosids I—Rosales; included in Urticaceae)

Trees or shrubs, dioecious, often with stilt-roots; sap watery, turning black. **Leaves** alternate, simple, palmatifid to -sect; stipules fused, fully amplexicaul. **Inflorescences** paired in axils of leaves, pedunculate, bracteate. **Flowers** unisexual, regular, small, ± sessile. **Male flowers** in branched inflorescences; tepals 2–4, free or basally united; stamens 1, 3 or 4; filaments straight in bud, not abruptly bending in dehiscence; anthers extrorse. **Female flowers** many in ± capitate inflorescences; tepals 2–4; ovary superior, 1-locular, free or basally adnate to perianth, with 1 basal, orthotropous, bitegmic ovule; style 1; stigma 1, sometimes tongue-shaped. **Fruit** achene-like or forming a drupaceous whole with accrescent, fleshy perianth. **Seed** large and without endosperm, or small and with endosperm; embryo straight.

Genera 6, species 180, confined to the tropics, 1 genus in Asia and Australasia, 3 in Neotropics, 2 (9 species) in Africa; in sthn trop. Afr. genera 2, species 4.

Formerly treated as subfamily Conocephaloideae of Moraceae, later moved to Urticaceae, being intermediate between them. Berg (1978) raised the Conocephaloideae to family rank.

Berg: 39 (1978); Berg: 87 (1989); Kubitzki: 243 (1993); Mabberley: 136 (1997); Takhtajan: 238 (1997).

Key to genera

Lamina peltate, palmatisect ..... **Musanga**
Lamina basally attached, palmatifid ..... **Myrianthus**

Musanga R.Br.

Brown: 453 (1818) under Moraceae; De Ruiter: 496 (1976) under Moraceae; Berg: 90 (1989).

Trees with stilt-roots. **Leaves** peltate with 8–18 radiating segments; in young plants lamina changing from entire to palmatisect, and from basally attached to peltate. **Male flowers** in many-flowered, globose glomerules borne on the ultimate dichotomies of cymosely branched inflorescences; tepals 2-lobed; stamen 1. **Female inflorescences** very many in dense clavate, capitate, somewhat flattened spikes; perianth tubular, usually 2-lobed; ovary free. **Fruit** free, borne inside slightly enlarged, fleshy, greenish perianth; endocarp crustaceous; mesocarp mucilaginous; exocarp membranous. **Seed** small; endosperm present.

Species 2, trop. Africa; sthn trop. Afr. 1: *Musanga cecropioides* Tedlie, N Angola.

Myrianthus P.Beauv.

Palisot de Beauvois: 16 (1805) under Moraceae; De Ruiter: 472 (1976) under Moraceae; Berg: 87 (1989); Berg: 77 (1991); White *et al.*: 395 (2001) under Moraceae; Coates Palgrave: 153 (2002).

Trees or shrubs, often with stilt-roots. **Leaves** with lamina basally attached, palmatifid. **Male flowers** in spike-like to globose glomerules borne on ultimate to more proximal branches of repeatedly dichotomously branched inflorescences; perianth of (3)4 ± imbricate tepals; stamens 3 or 4; filaments free or basally connate. **Female flowers** basally connate, in several- to many-flowered

globose-capitate inflorescences; perianth tubular, 2- or 3-lobed; ovary free. **Fruit** with fleshy exocarp adnate to enlarged fleshy, yellow to orange-red fruiting perianth; endocarp woody. **Seed** large, without endosperm.

Species 7, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique.

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Celastraceae

(Rosidae—Celastrales)
(Eurosids I—Celastrales)

Archer, R.H. & Jordaan, M. in Leistner: 214 (2000).

Sthn trop. Afr.: genera 25, speeies 88.

Key to genera

1a Fruit indehiseent; seeds without an aril:
2a Fruit drupaceous; leaves alternate, opposite or fasciculate:
3a Endoearp thiek and woody (stone); leaves usually opposite or fasciculate, glabrous; sepals ± subcircular with entire margin ..... **Elaeodendron**
3b Endoearp thin and crustaceous; leaves alternate, pubescent or glabrous; sepals ± deltoid with laciniate margin ..... **Mystroxylon**
2b Fruit baccate or small and nut-like; leaves opposite or subopposite, rarely alternate:
4a Fruit small, nut-like and asymmetric with persistent lateral style or stylar scar; leaves opposite; ovules 2–4 per locule ..... **Pleurostylia**
4b Fruit baccate:
5a Fruit often large and globose, 1–20-seeded; seeds irregular, large; ovary with 2–8 ovules per locule ..... **Salacia**
5b Fruit usually smaller, globose or ellipsoid, 1–3(–6)-seeded; ovary with 2 ovules per locule:
6a Climbing or scrambling shrubs; sepals 5 with ciliolate margins; stamens 5 ..... **Allocassine**
6b Tall lianes; calyx tearing open into 2 or 3 irregular lobes; stamens 3(4) ..... **Salicighia**
1b Fruit capsular or follicle-like, dehiscent when dry and mature; seeds with or without an aril:
7a Plants with spines; leaves fasciculate on brachyblasts, at least on older branches:
8a Suffrutices, shrubs or small trees; flowers nearly always functionally unisexual with staminodes in female, and pistillode in male flowers; ovules 2(3) per locule; ovary (2)3(4)-locular; seeds completely or incompletely enveloped by a well or weakly developed aril, or aril only a basal rim ..... **Gymnosporia**
8b Shrubs or woody climbers; flowers all bisexual; ovules 3–12 per locule; ovary always 3-locular; seeds completely enveloped by a well-developed aril ..... **Putterlickia**
7b Plants without spines; leaves opposite or alternate, never fasciculate:
9a Leaves alternate; seeds ellipsoid, with or without a membranous aril:
10a Capsules with wing-like emergences ..... **Pterocelastrus**
10b Capsules smooth or verruculose, without wing-like emergences ..... **Maytenus**
9b Leaves opposite, at least on flowering shoots; seeds flattened or irregularly shaped, with wings; aril reduced or absent:
11a Capsule elongated, narrow, dehiscing loculicidally in 3 valves; seeds winged, aril reduced or absent; stamens 5, outside the disc ..... **Catha**
11b Capsule expanded laterally, forming 3 dehiscent mericarps, each dehiscing by a median suture into 2 caducous valves; seeds with or without wings; stamens (2)3(4), inside the disc or absent ..... **Hippocratea**
(Hallé (1990) divides the **Hippocratea** complex into a number of genera):
12a Seeds densely pubescent around the embryo and with a wing with both a marginal vein and a marginal raphe; leaves with stellate hairs ..... **Helictonema**
12b Seeds glabrous, winged, with a marginal vein and a submedian vein:
13a Flowers without a disc; resin threads present (especially visible on breaking the petiole); stamens 3 or 5, curving inwards or ± erect:
14a Stamens 3, subextrorse; petals unequal, very fleshy, convex-incurved ..... **Bequaertia**
14b Stamens 3 or 5, introrse; petals subequal, slightly fleshy, spreading:
15a Stamens 3 ..... **Tristemonanthus**
15b Stamens 5 ..... **Campylostemon**

13b Flowers with a disc; resin threads present or absent; stamens 3, curving outwards:
16a Ovules 2 per locule; stigma not lobed or lobes opposite the stamens:
17a Disc extended upwards into a columnar or cylindric androgynophore:
18a Disc a broad ring, depressed in the centre, with a narrowly columnar androgynophore; leaves usually broadly obovate ... **Simicratea**
18b Disc narrow, somewhat lobed at the base; leaves usually elliptic or ovate ... **Simirestis**
17b Disc not extened upwards; androgynophore absent:
19a Style absent; stigmas 3, each curved downwards over an anther; disc divided into 3 crescent-shaped lobes ... **Apodostigma**
19b Style present; stigma punctiform or shortly 3-lobed; disc cup-shaped or a low circular pad, lobed or not:
20a Disc deeply cup-shaped ... **Elachyptera**
20b Disc a low pad, narrowly sinuous ... **Reissantia**
16b More than 2 ovules per locule; stigmatic lobes opposite to or alternating with the stamens:
21a Resin threads visible on breaking petioles; inner face of petals pubescent ... **Hippocratea**
21b Resin threads absent; inner face of petals glabrous or minutely puberulous:
22a Buds conical; petals ± valvate in bud ... **Loeseneriella**
22b Buds globose or cylindric, rounded; petals imbricate in bud:
23a Petals not unguiculate, elliptic to oblong; leaves without obvious reticulate venation ... **Pristimera**
23b Petals unguiculate, lamina ovate to subcircular; leaves with prominent reticulate venation:
24a Style conical and subulate; stigma simple; disc circular to patelliform ... **Prionostemma**
24b Style very short; stigma 3-lobed, almost sessile; disc lobed ... **Cuervea**

Allocassine N.Robson

Robson: 379 (1966); Robson & Sousa: 27 (1969); Archer & Van Wyk: 189 (1998b); Coates Palgrave: 624 (2002).

Monotypic genus: *Allocassine laurifolia* (Harv.) N.Robson; sthn trop. Afr.: Zimbabwe, Mozambique, and sthn Afr.

Apodostigma R.Wilczek

Wilczek: 402 (1956); Wilczek: 142 (1960); Hallé: 154 (1990); Robson *et al.*: 55 (1994); Phiri (Unpublished).

Hippocratea L. as to *H. pallens* Planch. ex Oliv.; Exell & Mendonça: 16 (1954/1956); Robson: 416 (1966).

Tall, glabrous, unarmed lianes, latex absent. **Leaves** opposite to slightly subopposite, simple, entire to faintly dentate, petiolate; stipules free, minute, inserted at nodes. **Inflorescences** of axillary, dichotomous cymes with a single terminal flower and two equal branches at each fork. **Flowers** small, somewhat irregular, pedicellate; young buds globose. **Sepals** 5, imbricate. **Petals** 5, not spreading but rather arcuate, 4 of them ± equally arched. **Disc** divided into 3 crescent-shaped substaminal lobes, each of which enfolds a stamen. **Stamens** 3; filaments very short, broad; anthers extrorse, transversely dehiscent; pollen small, simple, tricolporate. **Ovary** with 3 locules, each with 2 ovules; stigmas 3, sessile, together forming a ± triangular organ which exceeds the stamens, each stigma curved down over an anther. **Fruit** of 3 flattened mericarps, each dehiscing by median sutures into 2 caducous valves. **Seeds** 2 in each mericarp, winged, wings with a marginal vein and a submedian vein (raphe); cotyledons not united; radicle acute and prominent; germination epigeal.

Monotypic genus: *Apodostigma pallens* (Planch. ex Oliv.) R.Wilczek, trop. Africa and Madagascar; sthn trop. Afr.: Angola, Zambia, Mozambique.

Bequaertia R.Wilczek

Wilczek: 399 (1956); Hallé: 218 (1990); Robson *et al.*: 70 (1994).

Hippocratea as to *H. mucronata* Exell; Exell & Mendonça: 14 (1954/1956).

Glabrous lianes; older stems crenulate-dentate in cross section; latex present. **Leaves** opposite, petiolate; stipules extrapetiolar. **Inflorescences** of axillary dichotomous cymes, without accessory flowers or branches; bracts small, acute, opposite. **Flowers** small, ± 2–3 mm in diameter; buds shorter than wide. **Sepals** 5, small, with quincuncial aestivation. **Petals** very thick and fleshy, unequally imbricate. **Disc** absent. **Stamens** 3, with short filaments connate at base; anthers with extrorse, transverse dehiscence; pollen in tetrads, tricolporate. **Ovary** glabrous, 3-locular, half immersed; ovules 6–8(–12) per locule, in 2 series; style absent; stigma 3-lobed. **Fruit** of 3 dehiscent mericarps, each with 2 caducous valves. **Seeds** winged, with a marginal and a submedian vein (raphe), inserted into pocket-like structures at point of attachment; embryo with a prominent radicle; cotyledons not fused, containing latex.

Monotypic genus: *Bequaertia mucronata* (Exell) R.Wilczek, trop. Africa; sthn trop. Afr.: Angola.

Campylostemon Welw.

Welwitsch: 998 (1867); Exell & Mendonça: 11 (1954/1956); Robson: 417 (1966); Hallé: 264 (1986); Robson *et al.*: 73 (1994).

Lianes or scandent glabrous shrubs, with latex. **Leaves** opposite, elliptic to oblong or ovate-lanceolate, shallowly to rather deeply crenulate-serrulate, petiolate; stipules free, caducous. **Inflorescence** pedunculate, cymose, dichasial, simple, without axillary branches, axillary and sometimes terminal; bracts persistent. **Flowers** bisexual. **Sepals** 5, imbricate, free or ± united. **Petals** (4)5, imbricate in bud, entire, white to yellow. **Disc** absent. **Stamens** 3–5; filaments united at base, erect or incurved; anthers versatile, apical or introrse (?rarely extrorse), with thecae ± confluent, dehiscing transversely; pollen in tetrads. **Ovary** superior, 3-locular, with 5–16 axile ovules per locule, sessile; style absent; stigmas 3, free, divergent. **Fruit** of 3 capsular mericarps united at base; mericarps dorsiventrally flattened, dehiscing by median suture. **Seeds** with long, winged stalks as in *Hippocratea*. **Germination** epigeal (1 species). **Chromosome number**: 2n = 56 (1 species).

Species ± 10, trop. Africa; sthn trop. Afr. 3, Angola, Zambia.

Catha Forssk. ex Scop.

Robson: 379 (1966); Robson & Sousa: 29 (1969); Robson *et al.*: 25 (1994); White *et al.*: 185 (2001); Coates Palgrave: 616 (2002).

Sthn trop. Afr. 1: *Catha edulis* (Vahl) Forssk. ex Endl., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cuervea Triana ex Miers

Miers: 330, 370 (1872); Wilczek: 141 (1960); Hallé: 182 (1990).

Hippocratea L. as to *H. macrophylla* Vahl; Exell & Mendonça: 14 (1954/1956).

Tall-growing, unarmed lianes; latex present or absent. **Leaves** opposite, rarely subopposite, petiolate, large, ovate-elliptic, entire, coriaceous; stipules reduced. **Inflorescences** in axillary dichotomous cymes, often arranged in terminal panicles; buds globose. **Flowers** large, opening wide, pedicellate. **Sepals** 5, suborbicular, denticulate. **Petals** 5, widely spaced, obovate-circular, concave. **Disc** with 5 rounded lobes. **Stamens** 3, arising on inner margin of disc; filaments flattened, very short, ± as long as wide; anthers transversely dehiscent. **Ovary** 3-locular, with (4–) 6(–8) ovules per locule; stigma subsessile, 3-lobed. **Fruit** ± 150 mm in diameter, of 3 obovate-circular, flattened mericarps on a conical receptacle, each mericarp dehiscing by a median suture into 2 caducous valves. **Seeds** 4–6 per mericarp, weighing up to 15 g, not winged but with a prominent vein (raphe).

Species 5, 3 in tropical America, 2 in tropical W Africa; sthn trop. Afr. 1: *Cuervea macrophylla* (Vahl) Wilczek ex Hallé, Angola.

Elachyptera A.C.Sm.

Smith: 383 (1940); Wilczek: 138 (1960); Robson *et al.*: 48 (1994); Phiri (Unpublished).

Hippocratea L. in part; Exell & Mendonça: 16 (1954/1956).

Glabrous lianes or scrambling shrubs; latex absent. **Leaves** opposite or sometimes subopposite; blade often shiny above (especially in dried state) and usually greyish, brownish, reddish or blackish, more rarely olive-green, when dry. **Inflorescences** of cymes or groups of cymes with quadrangular or 4-winged internodes, with accessory branches in axils. **Flowers** small, 1.9–3.3 mm in diameter at anthesis; aestivation quincuncial. **Sepals** 5, slightly unequal, obscurely and irregularly dentate. **Corolla** rotate or semi-urceolate. **Petals** 5, orbicular or oblong, with 1–few veins, entire or weakly denticulate, imbricate to apex. **Disc** small, 0.6–0.9 mm in diameter, rather deeply cup-shaped, rim almost level with base of style, entire or with a split under each stamen. **Stamens** 3, with narrow flattened filaments free to base, inserted in a deep perigynous furrow; anthers transversely dehiscent, with an apical pore in bud stage, extrorse. **Ovary** with 3 locules; style subpyramidal with 3 reduced stigmatic lobes opposite stamens; ovules 2 per locule. **Fruit** with 3 mericarps, each with 2 caducous valves; seeds with or without a wing; if winged then wing with a submedian vein (raphe); cotyledons fused or merely adhering, with a cordate base, with radicle lying between lobes.

Species 7: 3 in tropical America, 3 in trop. Africa, 1 in Madagascar; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Elaeodendron Jacq.

Exell & Mendonça: 11 (1954/1956); Robson: 385 (1966); Robson & Sousa: 32 (1969); Robson *et al.*: 29 (1994); Archer & Condy: 58 (1995); Archer & Van Wyk: 93 (1998a); Coates Palgrave: 618 (2002); Izidine & Bandeira: 49 (2002).

Cassine L. in part; Burtt Davy *et al.*: 39 (1958); White: 215 (1962); White *et al.*: 182 (2001). *Crocoxylon* Eckl. & Zeyh.; Robson: 390 (1966); Robson & Sousa: 36 (1969).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gymnosporia (Wight & Arn.) Hook.f.

Exell: 75 (1927); Burtt Davy *et al.*: 40 (1958); Jordaan & Van Wyk: 177 (1999); Coates Palgrave: 598 (2002).

Maytenus Molina in part; Robson: 358 (1966); White *et al.*: 187 (2001).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Helictonema Pierre

Pierre: 73 (1898); Hallé: 136 (1990); Robson *et al.*: 43 (1994).

Hippocratea L. in part as to *H. velutina* Afzel.; Exell & Mendonça: 14 (1954/1956).

Tall lianes with terete stems, conspicuously pubescent, particularly the younger growths; latex absent. **Leaves** opposite, petiolate; blade entire, with stellate hairs especially beneath; stipules small, obscured by hairs. **Inflorescence** of paired cymes, without accessory branches, cymes often combining to form large panicles; bracts caducous. **Flowers** large, pedicellate, 12–15 mm in diameter; buds subglobose, enclosed to apex by sepals. **Petals** 5, imbricate, pubescent, unguiculate, with conspicuously fimbriate margins. **Disc** spreading, many-lobed, separated by a constriction from an expanded fleshy androgynophore which is crowned with hairs. **Stamens** 3; filaments bent outwards; anthers with extrorse transverse dehiscence; pollen simple, tricolporate, coarsely reticulate. **Ovary** with 3 locules, each with many ovules; stigma punctiform. **Fruit** dry with 3 dehiscent mericarps, each with 2 non-caducous valves; valves densely lined with hairs. **Seeds** densely pubescent around embryo, with a well-developed wing which has both a marginal vein and marginal raphe (i. e. raphe is not submedian); no pocket-like structure at point of attachment (such as occurs in *Simirestis* and *Pristimera*) but sometimes with the vestiges of arils.

Monotypic genus: *Helictonema velutinum* (Afzel.) Pierre ex N.Hallé, more humid regions of trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Hippocratea L.

Exell: 76 (1927); Exell: 225 (1932); Exell & Mendonça: 12 (1954/1956); Robson: 403 (1966); Robson & Sousa: 48 (1969); Hallé: 214 (1990); Coates Palgrave: 628 (2002); Mapaura & Timberlake: 165 (2002) under Hippocrateaceae.

In the strict sense, *Hippocratea* comprises only 3 species of which 2 occur in Africa, with 1 in sthn trop. Afr.: *Hippocratea myriantha* Oliv. in Angola. The other species assigned to this genus have been placed in various segre-

gate genera by Hallé (1990) and by Robson *et al.* (1994), as shown in the key to genera above. The segregate genera occurring in sthn trop. Afr. are here dealt with in the sense of Hallé (1990). This division of *Hippocratea* into segregate genera is not followed in some recent publications such as Coates Palgrave (2002) and Mapaura & Timberlake (2002). Archer & Jordaan (2000) show how such a division would affect southern Africa.

Loeseneriella A.C.Sm.

Smith: 438 (1941); Hallé: 190 (1990); Robson *et al.*: 65 (1994).

Hippocratea L. in part; Exell & Mendonça: 12 (1954/1956); Robson: 403 (1966); Robson & Sousa: 48 (1969).

Tall lianes or scandent shrubs; old stems grooved with fairly deep furrows filled with parenchyma. **Leaves** mostly opposite, petiolate; blade entire or moderately crenulate; stipules free or borne on a transverse flange-like structure. **Inflorescences** of axillary cymes without accessory branches. **Flowers** usually with conical buds. **Sepals** 5, equal or unequal, rather small. **Petals** 5, valvate or with margins slightly overlapping, often rather long, glabrous or pubescent. **Disc** very variable in its degree of development, often complex with a collar-like base encircling a separate fleshy pad, sometimes cup-like with centre extended upwards into a thick fleshy column. **Stamens** 3; anthers with extrorse, transverse dehiscence; pollen in monads, tricolporate, finely reticulate. **Ovary** 3-locular, thin-walled, enclosed within base of filaments; ovules 4–15(–20) per locule; style conic-pyramidal with a punctiform stigma. **Fruit** of 3 dehiscent mericarps, each with 2 caducous valves. **Seeds** winged, with a marginal and submedian vein (raphe), inserted into pocket-like structures at point of attachment; cotyledons fused; germination hypogeal.

Species 16, Old World tropics; sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Maytenus Molina

Exell & Mendonça: 1 (1954/1956); Robson: 358 (1966); Robson & Sousa: 5 (1969); Robson *et al.*: 3 (1994); Jordaan & Van Wyk: 177 (1999); White *et al.*: 187 (2001); Coates Palgrave: 590 (2002); Izidine & Bandeira: 49 (2002); Mapaura & Timberlake: 163 (2002).

Gymnosporia (Wight & Arn.) Hook.f., in part; Burtt Davy *et al.*: 40 (1958).

Sthn trop. Afr. ± 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mystroxylon Eckl. & Zeyh.

Exell & Mendonça: 10 (1954/1956); Robson: 376 (1966); Robson & Sousa: 25 (1969); Robson *et al.*: 21 (1994); Archer & Condy: 76 (1997); Coates Palgrave: 624 (2002).

Sthn trop. Afr. 1: *Mystroxylon aethiopicum* (Thunb.) Loes., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pleurostylia Wight & Arn.

White: 219 (1962); Robson: 381 (1966); Robson & Sousa: 30 (1969); Robson *et al.*: 27 (1994); White *et al.*: 188 (2001); Coates Palgrave: 626 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Prionostemma Miers

Miers: 330, 354 (1872); Hallé: 186 (1990); Archer & Jordaan: 217 (2000).

Hippocratea L. in part; Exell & Mendonça: 12 (1954/1956); Robson: 403 (1966).

Tall, glabrous scandent shrubs; without latex. **Leaves** opposite, elliptic to oblong or subcircular, entire or shallowly obtusely dentate; stipules acicular, not united. **Inflorescences** of cymes arranged in open panicles or of simple axillary dichasia; bracts entire, persistent. **Sepals** subcircular, somewhat unequal, margin ciliolate-denticulate. **Petals** 5, ovate-cordate to subcircular, concave and with a short claw, margin minutely ciliolate. **Disc** extrastaminal, single, slightly cup-shaped, margin subentire to slightly 5-lobed. **Stamens** 3; filaments short, broad; anthers 1-thecous, subcircular, extrorse. **Ovary** 3-locular, partly sunk into disc to almost free; style narrowly conical; stigmas united; ovules ± 8–20 per locule. **Fruit** of 3 flattened, ± obovate mericarps, each dehiscing by a median suture into 2 valves. **Seeds** winged, with marginal and submedian veins.

Species 5, tropical America, Asia, and 3 in trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Mozambique, and sthn Afr.

Pristimera Miers

Miers: 330, 360 (1872); Hallé: 8 (1981); Hallé: 197 (1986); Hallé: 160 (1990); Robson *et al.*: 57 (1994); Archer & Jordaan: 217 (2000).

Tall unarmed lianes or scandent shrubs; older stems normally terete, with pale yellow wood; latex usually absent. **Leaves** opposite or subopposite, petiolate; blade toothed, sometimes finely so, or occasionally entire; stipules small, free, with at least one prominent very acute tooth. **Inflorescences** of paired axillary dichotomous cymes with no accessory branches, sometimes forming a terminal panicle. **Flowers** small, pedicellate, 2–6 mm in diameter; buds globose to ovoid. **Sepals** 5, with quincuncial aestivation, equal or unequal, entire or ± denticulate. **Petals** 5, with quincuncial aestivation, sessile or rarely slightly unguiculate, overlapping in bud stage. **Disc** reduced, annular or cup-shaped, produced around base of ovary, sometimes lobed between petal bases; filaments arising directly on disc without an androgynophore. **Stamens** 3, small; anthers dehiscing by a transverse slit; pollen very small, simple, tricolporate. **Ovary** half sunken below point of attachment of filaments, trilobed with 3 locules, each with 4–10 ovules; style with a punctiform stigma or ± trilobed. **Fruit** of 3 flattened mericarps, each of which dehisces by median sutures into 2 caducous valves. **Seeds** winged, wing with a marginal and a submedian vein (raphe), inserted in a series of compressed triangular pocket-like structures at point of attachment; cotyledons united; ovules with no conspicuous features.

Species 24, America, Indonesia, Madagascar, and 12 in trop. Africa; sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, and sthn Afr.

Pterocelastrus Meisn.

Robson: 374 (1966); Robson & Sousa: 24 (1969); White *et al.*: 190 (2001); Coates Palgrave: 597 (2002).

Sthn trop. Afr. 1: *Pterocelastrus echinatus* N.E.Br., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Putterlickia Endl.

Robson: 356 (1966); Robson & Sousa: 3 (1969); Jordaan & Van Wyk: 299 (1998a); Jordaan & Van Wyk: 322 (1998b).

Sthn trop. Afr. 1: *Putterlickia verrucosa* (E.Mey. ex Sond.) Szyszyl., Mozambique, and sthn Afr.

Reissantia N.Hallé

Hallé: 466 (1958); Hallé: 150 (1990); Robson *et al.*: 51 (1994); Archer & Jordaan: 217 (2000).

Hippocratea L. in part; Exell & Mendonça: 12 (1954/1956); Robson: 403 (1966).

Unarmed climbers or scandent shrubs; older stems ± terete, younger ones 4-angled or unequally grooved; latex absent. **Leaves** opposite or subopposite, entire or sometimes with a crenulate margin; stipules minute, free. **Inflorescences** consisting of axillary dichotomous cymes with small accessory branches, or flowers sometimes in small panicles; bracts small, opposite, acute. **Flowers** pedicellate, small; young buds globose. **Sepals** 5. **Petals** 5, imbricate in bud, suberect. **Disc** a small, narrow rim, slightly sinuous, surrounding base of ovary and filaments. **Stamens** 3, extrorse; filaments flattened; anthers circular in outline after dehiscence; pollen small, simple, tricolporate, scarcely ornamented. **Ovary** with 3 locules; ovules 2 per locule; style erect, subulate, longer than wide, glabrous; stigmas united, punctiform. **Fruit** of 3 flattened mericarps, each dehiscing by a median suture into 2 caducous valves. **Seeds** 2 in each carpel, winged, wing with a marginal and a submedian (raphe) vein; cotyledons not united; radicle acute and prominent; germination epigeal.

Species 6, Old World tropics; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Salacia L.

Exell & Mendonça: 23 (1954/1956); Robson: 391 (1966); Robson & Sousa: 38 (1969); Hallé: 18 (1990); Robson *et al.*: 33 (1994); White *et al.*: 190 (2001); Coates Palgrave: 632 (2002).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Salacighia Loes.

Loesener: 228 (1940); Exell & Mendonça: 27 (1954/1956); Hallé: 8 (1990).

Tall lianes up 30 m long and up to 100 mm in diameter; latex absent; branches reddish, lenticelled. **Leaves** opposite or ± alternate, petiolate, elliptic, acuminate, entire. **Inflorescences**: flowers borne in few- to many-flowered fascicles on slender, often ± pendent, leafless branches arising on long leafless woody inflorescence branches borne between ground level and a height of 4 m on woody stems; buds ± globose. **Calyx** tearing open into 2 or 3 irregular lobes. **Petals** (4)5(–7), ± circular, with fimbriate margin. **Disc** thick, fleshy, subpentagonal. **Stamens** 3(4); filaments short, broad and flattened, arising in a perigynous groove; anthers extrorse, divided into slightly oblique thecae; pollen in tricolporate monads. **Ovary** with 3(4) locules; style short, pyramidal, ending in a punctiform stigma; ovules 2 per locule, superposed. **Fruit** a globose berry, sometimes with 3(4) longitudinal grooves. **Seeds** 1–6, subglobose, without endosperm, slightly mucilaginous.

Species 2, tropical W Africa; sthn trop. Afr. 1: *Salicighia letestuana* (Pellegr.) Blakelock (=*S. malpighioides* Loes.), Angola (Cabinda).

Simicratea N.Hallé

Hallé: 18 (1983); Hallé: 140 (1990); Robson *et al.*: 46 (1994).

Unarmed lianes, entirely glabrous; older bark covered with a thin papery orange layer (as in some *Salacia* species); stems terete; latex absent. **Leaves** opposite, petiolate; stipules reduced. **Inflorescences** of paired cymes with no accessory branches. **Flowers** pedicellate, rather similar in appearance to those of *Salacia* species; aestivation quincuncial, petals overlapping to apex. **Disc** spreading, cushion-like (but thin in dried state) with a central depression carrying a narrowly columnar androgynophore. **Stamens** 3, with flattened filaments; anthers with transverse dehiscence; pollen in monads, tricolporate, reticulate. **Ovary** completely superior, with 3 locules; ovules 2 per locule; style tapering, with a subpunctiform stigma. **Fruit** of 3 flattened mericarps, each dehiscing into 2 caducous valves. **Seeds** 2 in each mericarp, winged, with a marginal vein and a submedian vein (raphe), inserted on an elevated bilobed structure which surrounds the placental tube; cotyledons joined or free; radicle very reduced.

Monotypic genus: *Simicratea welwitschii* (Oliv.) N.Hallé, moist trop. Africa; sthn trop. Afr.: Angola.

Simirestis N.Hallé

Hallé: 464 (1958); Hallé: 4 (1984); Hallé: 174 (1990); Robson *et al.*: 62 (1994).

Hippocratea L. in part; Robson: 403 (1966); White *et al.*: 185 (2001); Mapaura & Timberlake: 165, 175 (2002) under Hippocrateaceae.

Tall, unarmed lianes; older stems normally terete, with pale yellow wood; latex absent. **Leaves** opposite or subopposite, petiolate, entire or dentate; stipules very reduced. **Inflorescences** axillary, pedunculate, sometimes forming a terminal panicle; cymes dichotomous, always without accessory branches, their internodes ± quadrangular; bracts small, acute, opposite. **Flowers** moderately sized, 5–10 mm in diameter, often green, sometimes yellow, ± pedicellate; buds globose, ovoid or oblong. **Sepals** 5, with quincuncial aestivation, ovate or nearly round, equal or unequal, entire or minutely fimbriolate. **Petals** 5, with quincuncial aestivation, elliptic, oblong or somewhat spathulate, sessile, overlapping markedly in bud. **Disc** slightly sinuous just above base of petals, then extended upwards into a fleshy, ± cylindric or truncate-conical androgynophore. **Stamens** 3, each arising on an ovary locule at about $^1/_2$- or $^2/_3$-way up locule; pollen simple, tricolporate. **Gynoecium** with 3 swellings between filaments and 3 small furrows hidden by filaments; ovary 3-locular; ovules 4–12 per locule, arranged ± in 2 ranks; style small, slender to subpyramidal, truncate or obscurely 3-lobed at apex. **Fruit** of 3 flattened mericarps, each dehiscing along a median suture into 2 deciduous valves. **Seeds** winged, wing with a marginal and a submedian (raphe) vein.

Species 8, trop. Africa; sthn trop. Afr. 2, Angola, Malawi.

Tristemonanthus Loes.

Loesener: 226 (1940); Hallé: 220 (1990).

Woody, glabrous lianes with latex; young branches reddish. **Leaves** opposite, petiolate, ± elliptic, entire to slightly undulate; stipules extrapetiolar. **Inflorescences** axillary dichotomous cymes, sometimes arranged in panicles; young buds globose; bracts small, deltoid, pointed, persistent. **Sepals** 5, short, semicircular, sparsely denticulate, with quincuncial aestivation. **Disc** absent. **Stamens** 3, united at base, longer than gynoecium; filaments clasping at base; anthers 2-thecous, dehiscing transversely; pollen in tetrads of 4 tricolporate monads. **Ovary** 3-locular; stigma subsessile, 3-lobed; ovules 4–8 per locule, in 2 ranks. **Fruit** of 3 elliptic, flattened mericarps, each dehiscing along a median suture into 2 deciduous valves. **Seeds** winged.

Species 2, tropical W Africa; sthn trop. Afr. 1: *Tristemonanthus mildbraedianus* Loes., Angola (Cabinda).

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Celtidaceae

(Dilleniidae-Urticales)
(Eurosids I-Rosales; included in Cannabaceae)

Jordaan, M. in Leistner: 550 (2000) under Ulmaceae.

Sthn trop. Afr.: genera 3, species 7.

Celtis L.

Hauman: 41 (1948); Polhill: 139 (1964); Wilmot-Dear: 6 (1991); Wilmot-Dear: 243 (1999); White *et al.*: 573 (2001); Coates Palgrave: 125 (2002); Mapaura & Timberlake: 169 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chaetacme Planch.

Rendle: 13 (1916); Polhill: 144 (1964); Wilmot-Dear: 1 (1991);Wilmot-Dear: 239 (1999); White *et al.*: 575 (2001); Coates Palgrave: 128 (2002) as *Chaetachme*.

Monotypic genus: *Chaetacme aristata* Planch., Africa and Madagascar; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Trema Lour.

Polhill: 143 (1964); Wilmot-Dear: 3 (1991); Wilmot-Dear: 241 (1999); St-Laurent *et al.*: 34 (2000); White *et al.*: 575 (2001); Coates Palgrave: 128 (2002).

Sthn trop. Afr. 1: *Trema orientalis* (L.) Blume, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Ceratophyllaceae

(Magnoliidae—Ceratophyllales)
(Ceratophyllales; position uncertain)

Glen, R.P. in Leistner: 220 (2000).

Sthn trop. Afr.: genus 1, species 3.

Ceratophyllum L.

Wilmot-Dear: 125 (1991); Les: 246 (1993); Lebrun & Stork: 93 (2003).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Chenopodiaceae

(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales; included in Amaranthaceae)

Jordaan, M. in Leistner: 221 (2000). See key to genera in that work.

Sthn trop. Afr.: genera 9, species ± 27.

Atriplex L.

Brenan: 144 (1988).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Bassia All.

Chenolea Thunb.; Brenan: 147 (1988); Kühn: 269 (1993).

Sthn trop. Afr. 1: *Bassia diffusa* (Thunb.) Kuntze, Mozambique, and sthn Afr.

Chenopodium L.

Binns: 27 (1968); Brenan: 136 (1988).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Exomis Fenzl ex Moq.

Brummitt (Unpublished).

Sthn trop. Afr.: the genus may be represented in Angola by *Exomis microphylla* (Thunb.) Aellen. Genus also present in sthn Afr.

Halosarcia Paul G.Wilson

Brenan: 147 (1988).

Arthrocnemum not of Moq., in part.

Sthn trop. Afr. 1: *Halosarcia indica* (Willd.) Paul G.Wilson, Mozambique, and sthn Afr.

Salicornia L.

Brenan: 153 (1988).

Sthn trop. Afr. 2, Mozambique, and sthn Afr.

Salsola L.

Brenan: 159 (1988); Klopper & Van Wyk: 540 (2001); Izidine & Bandeira: 57 (2002); Lebrun & Stork: 296 (2003).

Sthn trop. Afr. 1: *Salsola angolensis* Botsch., and 1 (insufficiently known), Angola, Mozambique, and sthn Afr.

Sarcocornia A.J.Scott

Brenan: 149 (1988); Izidine & Bandeira: 49 (2002).

Sthn trop. Afr. 4, Mozambique, and sthn Afr.

Suaeda Forssk. ex J.F.Gmel.

Brenan: 154 (1988); Izidine & Bandeira: 49 (2002); Lebrun & Stork: 298 (2003).

Sthn trop. Afr. ± 4, Angola, Zambia, Mozambique, and sthn Afr.

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Chrysobalanaceae

(Rosidae—Rosales)
(Eurosids I—Malpighiales)

Jordaan, M. in Leistner: 226 (2000).

Sthn trop. Afr.: genera 6, species ± 18.

Key to genera

1a Ovary arising at or near base of receptacle; flowers ± regular; endocarp with 4–8 longitudinal ridges ..... **Chrysobalanus**

1b Ovary arising laterally in upper half or at mouth of receptacle tube:

2a Epicarp closely verrucose, endocarp with 2 small basal 'plugs' or 'stoppers' which allow seedlings to escape; bracts and bracteoles completely concealing flower buds up to anthesis, both individually and in small groups; lower surface of leaves with small stomatal cavities filled with hairs ..... **Parinari**

2b Epicarp not verrucose, endocarp without basal plugs but sometimes dehiscing at germination by means of 2 lateral plates; bracts and bracteoles not enclosing flowers in groups; lower surface of leaves without hair-filled stomatal cavities:

3a Endocarp with 2 lateral germination plates; carpels 2-locular; receptacle not ventricose; sepals suborbicular, concave ..... **Maranthes**

3b Endocarp without lateral germination plates; carpels 1-locular; receptacle often ventricose; sepals acute, not concave:

4a Filaments fused for most of their length into a long slender channel ..... **Dactyladenia**

4b Filaments free or fused only towards base:

5a Flowers slightly irregular; receptacle tube not oblique at throat; sepals subequal; filaments far exserted; staminodes almost free; endocarp with 4–7 shallow longitudinal channels ..... **Hirtella**

5b Flowers strongly irregular; receptacle tube usually markedly oblique at throat; sepals unequal; filaments included; staminodes largely or completely united; endocarp without longitudinal channels ..... **Magnistipula**

Chrysobalanus L.

Linnaeus: 513 (1753); White: 68 (1962) under Rosaceae; Mendes: 6 (1970); White: 272 (1976); Letouzey & White: 60 (1978); White: 34 (1978).

Evergreen shrubs or trees. **Leaves** suborbicular to lanceolate-elliptic, petiolate, lower leaf surface glabrous or with a few stiff appressed hairs. **Inflorescence** a short, few-flowered raceme of cymules or cymose throughout, or a false raceme or a subsessile fascicle; bracts small, eglandular. **Flowers** regular. **Calyx**: tube (receptacle) cupuliform, interior and exterior puberulous; lobes 5, acute, subequal. **Petals** 5, longer than sepals. **Stamens** 12–26, forming a complete circle; filaments hairy, ± twice as long as sepals, appearing slightly united at base. **Ovary** of 1 carpel, 1-locular, arising at base of receptacle, covered with a dense mass of hairs; styles puberulous; stigma slightly expanded, shallowly 3-lobed. **Fruit** a small, glabrous drupe; endocarp thin, hard, interior glabrous, exterior smooth, with 4–8 prominent longitudinal ridges corresponding to lines of fracture that allow seedling to escape.

Species 2, tropical America, tropical Africa; sthn trop. Afr. 1: *Chrysobalanus icaco* L., Angola, Zambia.

Dactyladenia Welw.

Welwitsch: 572 (1859); Prance & White: 483 (1979).

Acioa Aubl. in part, as to African species; Exell: 161 (1928); Mendes: 19 (1970); Letouzey & White: 6 (1978).

Shrubs or small trees, sometimes scandent. **Leaves** usually with 2 glands on lower surface near base; petiole eglandular; stipules usually present. **Inflorescence** a simple raceme or a raceme of zig-zag, usually lax, false racemes; bracts and bracteoles not enclosing flower buds. **Flowers** bisexual, very irregular; receptacle tube usually elongate and narrowly obconic-tubular, usually longer than upper pedicel, often slightly gibbous at base, glabrous inside except near throat. **Sepals** 5, rounded or acute, usually spreading or reflexed, often with stalked or sessile marginal glands, adaxial surface whitish-tomentellous. **Petals** 5, caducous. **Stamens** 10–75, coiled in bud; filaments ligulately connate for most of length; arising on posterior rim of faucal annulus, far exserted, much longer than combined length of calyx and receptacle tube; staminodes short, filiform or denticulate. **Ovary** 1-locular, with 2 ovules, of 1 carpel, arising in mouth of receptacle tube; style filiform, slightly longer than stamens, slightly 3-lobed at apex. **Fruit** a ± ovoid drupe, usually longer than 30 mm, usually markedly tapered towards pointed apex; epicarp often ferruginous-tomentose and with longer hispid hairs, less often glabrous; mesocarp thin; endocarp thin but hard, with a roughish surface, hairy inside, with no special mechanism allowing seedlings to escape.

Species 27, trop. Africa; sthn trop. Afr. ± 5, Angola.

Hirtella L.

Linnaeus: 34 (1753); Burtt Davy *et al.*: 83 (1958) under Rosaceae; White: 276 (1978); White *et al.*: 191 (2001).

Evergreen trees, sometimes flowering as shrubs. **Leaves** lanceolate or lanceolate-elliptic, petiolate, lower surface glabrous or with a few strigose or strigulose hairs; stipules subulate, persistent. **Inflorescence** many-flowered, usually a lax raceme or an elongate thyrse with patent flowers or lateral branches usually bearing several sterile bracts and ending in a single flower or a few cymosely arranged flowers. **Flowers** slightly irregular; bracts and bracteoles often with stalked or sessile glands. **Calyx**: tube (receptacle) subcampanulate to narrowly cylindric, slightly gibbous, usually shorter than sepals, usually glabrous inside except near throat, and hairy outside; lobes 5, subequal, usually spreading or reflexed. **Petals** 5, shorter than sepals. **Stamens** 3–9; filaments laxly undulate in bud with a single undulation inserted on abaxial surface of disc, far exserted, usually much longer than combined length of calyx lobes and tube; staminodes short, free. **Ovary** of 1 carpel, 1-locular, usually inserted at mouth of calyx tube; style filiform, far exserted. **Fruit** a drupe with scanty mesocarp and smooth, thin, hard, non-granular endocarp with 4–7 longitudinal shallow channels which represent lines of weakness that permit seedling to escape. **Germination** hypogeal; first leaves alternate.

Species 90, of these 88 occur in Central and S America and 1 in E Africa, and Madagascar: *Hirtella zanzibarica* Oliv.; sthn trop. Afr.: Malawi, Mozambique.

Magnistipula Engl.

Engler: 226 (1905); Mendes: 17 (1970); White: 281 (1976); White: 45 (1978); Champluvier: 393 (1990).

Hirtella in sense of White: 69 (1962).

Trees, shrubs or geoxylic suffrutices. **Leaves** ± oblanceolate-oblong; shortly petiolate, lower surface glabrous or with a few strigose hairs; stipules subulate, persistent or caducous. **Inflorescence** a many-flowered panicle, usually thyrsoid, sometimes extremely contracted and racemoid. **Flowers** markedly irregular. **Calyx**: tube (receptacle) always curved, obliquely campanulate, slightly to strongly gibbous, nearly always markedly oblique at mouth, always longer than sepals, glabrous inside only at base; lobes 5, acute, usually very unequal in size. **Petals** 5, longer than sepals, persistent. **Stamens** 5–9; filaments white, coiled in bud, arcuate at anthesis, scarcely longer than sepals, flattened at base and appearing united for at least $^1/_3$ of length; staminodes appearing partly or completely united to form a short comb- or tongue-like structure. **Ovary** of 1 carpel, mostly 1-locular, arising at mouth of calyx tube; style arcuate, scarcely longer than sepals, glabrous or hairy only at base. **Fruit** a fleshy drupe; endocarp hairy inside, on germination breaking up in an irregular manner. **Germination** hypogeal; first leaves opposite.

Species 11, trop. Africa and Madagascar; sthn trop. Afr. 3, Angola, Zambia and Malawi.

Maranthes Blume

Blume: 89 (1825); Mendes: 14 (1970); White: 294 (1976); White: 41 (1978); Coates Palgrave: 251 (2002).

Evergreen trees. **Leaves** ovate to elliptic-oblong, petiolate, lower surface glabrous or with dense arachnoid indumentum; stipules caducous. **Inflorescence** a many-flowered corymb or panicle; bracts and bracteoles eglandular, caducous, not concealing young flowers. **Flowers** slightly irregular. **Calyx**: tube (receptacle) often slightly curved, obconoidal or subcampanulate, always gradually narrowed into pedicel, nearly always almost solid and almost completely filled with nectariferous tissue, glabrous inside on one side, hairy on other, or completely glabrous; lobes suborbicular, deeply concave. **Petals** suborbicular to broadly lingulate. **Stamens** 2–60; filaments white, arising in 2 rows on free margin of disc; tightly undulate in bud with 2 or more undulations, much longer than sepals, usually occurring in a tangled mass; staminodes few and vestigial or absent. **Ovary** of 1 or sometimes 2 or 3 bilocular carpels, arising at mouth of receptacle tube; style curved upwards, much longer than sepals, glabrous except at base. **Fruit** a fleshy drupe; endocarp very hard, fibrous with a rough exterior; glabrous inside, with 2 lateral plates which break away on germination and allow seedlings to escape. **Germination** epigeal; first leaves opposite.

Species ± 12, confined to Africa except for 1 species which is widespread in Malaysia, New Guinea and Australia and a second which is only known from Panama; sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Parinari Aubl.

Burtt Davy *et al.*: 83 (1958) under Rosaceae; White: 69 (1962) under Rosaceae; Mendes: 8 (1970); White: 310 (1978); White: 36 (1978); White *et al.*: 193 (2001); Coates Palgrave: 250 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Clusiaceae
(Guttiferae; including Hypericaceae)
(Dilleniidae—Guttiferales)
(Eurosids I—Malpighiales)

Bredenkamp, C.L. in Leistner: 227 (2000).

Sthn trop. Afr.: genera 11, species 39.

Key to genera

[adapted from Bamps (1970) and Bamps *et al.* (1978)]

1a Styles 1–5, well-developed; flowers bisexual:
2a Style 1, entire or stigma peltate; ovary 1-locular; ovule 1:
3a Style entire; flowers 5-merous; stamens fused into a staminal tube ..... **Endodesmia**
3b Style ending in a peltate stigma; flowers 4-merous; stamens in 4 antepetalous fascicles or ± free ..... **Calophyllum**
2b Styles 2–5, free to variously fused; ovary 3–5-locular; ovules 1–many:
4a Stamens fused into a tube; styles joined, spreading at the apex; fruit a berry ..... **Symphonia**
4b Stamens arranged in fascicles or sometimes free; styles free to $^3/_4$-fused; fruit a capsule, drupe or berry:
5a Tall trees, usually with a straight clean bole; petals glabrous on the inner face; fruit a berry; flowers in racemes or panicles ..... **Pentadesma**
5b Herbs, subshrubs, shrubs or small trees; flowers in cymes, cymose panicles or solitary:
6a Petals yellow, often tinged red, glabrous on their inner faces; cymes double or corymbiform or flowers solitary; fruit a capsule or rarely a berry ..... **Hypericum**
6b Petals white, velvety on their inner faces; cymes corymbiform or umbelliform or flowers in panicles; fruit a berry or a drupe:
7a Fruit drupaceous, with 5 pyrenes; ovules 2–4 per locule ..... **Harungana**
7b Fruit a berry:
8a Ovules 1 per locule; berry 5-seeded ..... **Psorospermum**
8b Ovules 5–8 per locule; berry ± 25–40-seeded ..... **Vismia**
1b Style obsolete, the stigma sessile or subsessile, peltate or lobed and spreading; plants dioecious or polygamous, less often bisexual:
9a Ovary incompletely 5-locular, with 2–28 ovules per locule; placentation parietal; stamens grouped in 5 fleshy bundles, the anthers subsessile and disposed in several rows superposed on the inner face or on both faces of the bundle ..... **Allanblackia**
9b Ovary completely 2–5-locular; ovules 1 or 2 per locule; placentation basal or apical:
10a Fruit a drupe; ovary 2-locular with 2 ovules per locule, or 4-locular with 1 ovule per locule; placentation basal; stamens fused into a ring at the base; filaments well-developed; calyx entire in bud, dividing into 2(3) segments during anthesis ..... **Mammea**
10b Fruit a berry; ovary 2–4-locular, with 1 ovule per locule; placentation apical; stamens free or inserted on a cylindric to cupular disc or grouped in 2–5 bundles with the anthers borne at the summit, either on distinct free or connate filaments or ± sessile; calyx with (3)4 or 5 distinct lobes in bud ..... **Garcinia**

Allanblackia Oliv. ex Benth.

Bentham: 980 (1867); Gossweiler & Mendonça: 63 (1939); Exell & Mendonça: 125 (1937/1951); Bamps: 13, 19 (1969). Bamps: 42 (1970); Bamps *et al.*: 7 (1978).

Trees with hollow, longitudinally wrinkled branches. **Leaves** opposite, with secretory canals visible on lower surface. **Inflorescences** terminal racemes or panicles with much reduced secondary axes, sometimes solitary or paired in axils of upper leaves, or sometimes pseudoaxillary on short lateral branches. **Flowers** unisexual. **Sepals** 5, imbricate, unequal. **Petals** 5, imbricate. **Male flowers**: stamens many, grouped in 5 very

fleshy bundles opposite petals; bundles consist of almost completely fused filaments with subsessile, longitudinally dehiscent anthers in several rows on inner face or on both faces of upper, somewhat flattened part of bundle; disc star-shaped with 5 rectangular or spoon-shaped rays alternating with staminal bundles. **Female flowers** with 5 rudimentary staminal bundles alternating with 5 free disc glands; ovary conical, with 5 incompletely separated locules and parietal placentas; ovules 2–28 per locule, arranged in 2 rows; stigma peltate, sessile or subsessile. **Fruit** an ovoid or ellipsoid berry, often very large. **Seeds** 4–80, ovoid, arillate.

Species 10, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda).

Calophyllum L.

Linnaeus: 513 (1753); Robson: 392 (1961); Bamps *et al.*: 2 (1978).

Trees or rarely shrubs secreting a milky, yellow or clear latex. **Leaves** opposite, almost always petiolate, entire, often coriaceous, with many lateral nerves close together and parallel (usually nearly at right angles to midrib) alternating with ± translucent glandular canals. **Flowers** bisexual, terminal or axillary, in few- to many-flowered racemes or paniculate cymes or rarely reduced to 1–3. **Sepals** 4, decussate, free, inner pair sometimes ± petaloid. **Petals** 4–8 (sometimes 0), white, imbricate, not always distinguishable from inner sepals. **Androecium** of 4 antepetalous stamen fascicles each of many stamens, or sometimes with stamens apparently free; filaments slender and sometimes flexuous; anthers ovate to linear-oblong; fasciclodes absent. **Ovary** 1-locular, with a single erect ovule; style simple, slender, often flexuous; stigma peltate. **Fruit** a 1-seeded drupe with crustaceous pericarp. **Seed** large.

Species ± 140, most abundant in tropical Asia and Australasia, but also occurring in Madagascar, the Mascarene Islands, East Africa and tropical America; sthn trop. Afr. 1: *Calophyllum inophyllum* L., Mozambique.

Endodesmia Benth.

Bentham: 166 (1862); Gossweiler & Mendonça: 54 (1939); Exell & Mendonça: 121 (1937/1951); Bamps: 40 (1970).

Tall trees; branches ± cylindric, smooth and glabrous. **Leaves** opposite, petiolate, elliptic to obovate, obtuse to cuneate at base, ± long-acuminate at apex, with numerous parallel lateral veins and translucid glandular canals indistinct in mature leaves. **Inflorescences** terminal or axillary cymes. **Flowers** bisexual. **Sepals** 5, imbricate, caducous. **Petals** 5, contorted, caducous. **Disc** circular, surrounding base of ovary. **Stamens** fused into a tube; anthers many, stipitate and arising on inside of staminal tube along its entire height. **Ovary** 1-locular and 1-ovate; style narrowly cylindric, truncate. **Fruit** drupaceous, on a thick, fleshy pedicel. **Seed** 1, subglobose; cotyledons fleshy.

Monotypic genus: *Endodesmia calophylloides* Benth., trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Garcinia L.

Exell & Mendonça: 126, 370 (1937/1951); Robson: 396 (1961); White: 254 (1962); Bamps *et al.*:14 (1978); White *et al.*: 281 (2001); Coates Palgrave: 736 (2002); Lebrun & Stork: 610 (2003).

Sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Harungana Lam.

Lamarck: t. 645 (1796); Exell & Mendonça; 121 (1937/1951); Robson: 390 (1961); White: 256 (1962); Bamps: 13 (1970); Bamps *et al.*: 32 (1978); White *et al.*: 285 (2001); Coates Palgrave: 735 (2002).

Haronga Thouars; Exell: 27 (1927); White: 256 (1962) as synonym.

Trees or shrubs. **Leaves** opposite, petiolate, entire, with opaque glandular dots and stellate or dendroid indumentum. **Inflorescence** a terminal corymbose panicle. **Flowers** bisexual. **Sepals** 5, glanduliferous. **Petals** 5, ± villous within, glanduliferous, sometimes with swollen nectariferous tissue at base. **Androecium** of 5 fascicles of stamens with few stamens in each fascicle, with filaments fused for most of their length, and with 5 fleshy scale-like fasciclodes alternating with fascicles. **Ovary** 5-locular; styles 5, free or united at base; ovules 2(3) per locule, basal. **Fruit** a drupe with 5 pyrenes cohering to form a spherical mass. **Seeds** cylindric, curved.

Species 2, trop. Africa and Mascarene islands; sthn trop. Afr. 1: *Harungana madagascariensis* Lam. ex Poir., Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Hypericum L.

Exell & Mendonça: 119, 369 (1937/1951); Robson: 379 (1961); White: 256 (1962); White *et al.*: 285 (2001); Coates Palgrave: 734 (2002); Lebrun & Stork: 617 (2003).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mammea L.

Linnaeus: 512 (1753); Exell & Mendonça: 125, 370 (1937/1951); Bamps: 50 (1970); Bamps: 60 (1971a); Bamps *et al.*: 11 (1978).

Ochrocarpos Thouars; Oliver: 169 (1868) as *Ochrocarpus*; Exell: 30 (1927) as *Ochrocarpus*.

Tall trees with greyish branches. **Leaves** opposite, petiolate, simple, oblong to elliptic, entire, glabrous, coriaceous, with numerous translucid dots; midrib very prominent beneath, lateral veins parallel, fairly inconspicuous; stipules 0. **Flowers** bisexual and male, regular; male flowers in axillary fascicles, usually on nodes from which leaves have already fallen; bisexual flowers solitary, axillary, on a long, accrescent pedicel. **Calyx** entire in bud, opening into 2(3) ± persistent segments. **Petals** 4(5–6), elliptic to obovate, glabrous, white, caducous. **Stamens** many, free or fused into a ring at base. **Ovary** 2-locular; ovules 2 per locule, sometimes 4-locular with 1 ovule per locule due to a false septum; placentation basal; style very short; stigma peltate, 2–4-lobed. **Fruit** drupaceous, rarely dehiscent, with 1–4 fibrous, 1-seeded nutlets. **Seeds** large; embryo with a large fleshy radicle and cotyledons reduced to a mamilliform projection or 0.

Species ± 50, tropics of Old and New World; sthn trop. Afr. 1: *Mammea africana* Sabine, Angola (Cabinda).

Pentadesma Sabine

Sabine: 457 (1824); Oliver: 164 (1868); Exell: 27 (1927); Exell & Mendonça: 131 (1937/1951) in part; Van Meer: 411 (1965); Bamps: 31 (1970); Bamps: 62–66 (1971b).

Tall trees, usually with a long clean bole; bark dark brown to almost black. **Leaves** opposite, grouped towards tips of branches, petiolate, oblong to obovate, cuneate at base, obtuse or shortly acuminate at apex, coriaceous, glabrous; lateral veins parallel, not clearly visible on upper surface; glandular dots not visible on lower surface. **Inflorescences** terminal, racemose panicles or racemes. **Flowers** bisexual; large and showy; pedicel stout, articulated near base. **Sepals** 5, free, 2 exterior shorter than interior ones which equal petals, imbricate, concave, coriaceous, ± persistent. **Petals** 5, free, contorted in bud, coriaceous, oblong or ovate, ± persistent. **Stamens** many, in 5 epipetalous fascicles alternating with 5 small pyramidal bodies; filaments filiform, shortly connate at base; anthers filiform, with very short pointed tail at base. **Ovary** 5-locular, ovoid-ellipsoid, with 7–14 axile ovules in 2 rows per locule; style elongated, ending in 5 linear lobes. **Fruit** a large 5-locular, globose or ovoid berry with coriaceous exocarp and with calyx, stamens and pyramidal bodies persistent at base. **Seeds** ± triangular or irregularly shaped, embedded in yellow pulp.

Species 5, trop. Africa; sthn trop. Afr. 1: *Pentadesma butyracea* Sabine, Angola (Cabinda).

Psorospermum Spach

Spach: 157 (1836); Exell & Mendonça: 121 (1937/1951); Robson: 387 (1961); White: 257 (1962); Bamps: 440 (1966); Bamps: 17 (1970); Bamps *et al.*: 32 (1978); Coates Palgrave: 735 (2002).

Trees, shrubs or shrublets. **Leaves** opposite, less frequently subopposite or alternate, petiolate, entire, often furnished with opaque glandular dots and stellate indumentum. **Inflorescence** a terminal panicle, usually cymose. **Flowers** bisexual. **Sepals** 5, with longitudinal linear glands. **Petals** 5, villous within, furnished with longitudinal glandular lines and swollen nectariferous tissue at base. **Androecium** of 5 fascicles of stamens, with few to many stamens in each fascicle and filaments united for most of their length; fasciclodes 5, fleshy, scale-like, alternating with fascicles. **Ovary** 5-locular, with 1(2)-ovulate locules and ascending ovules; styles 5, free. **Fruit** a berry. **Seeds** large, with a fleshy glandular-punctate testa.

Species 45, trop. Africa and Madagascar; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique. This genus differs from *Vismia* Vand. in having usually one ovule per locule instead of many, and seeds with a fleshy testa.

Symphonia L.f.

Linnaeus (filius): 49 (1782, '1781'); Exell & Mendonça: 130 (1961); White: 257 (1962); Bamps: 34 (1970); Bamps *et al.*: 5 (1978).

Medium or large trees, with a straight bole and a crown of short horizontal branches. **Leaves** opposite, petiolate, entire, ± coriaceous, glabrous, with ± prominent venation, opaque or rarely with translucent glands. **Inflorescence** a terminal, one- to many-flowered, corymbose or umbellate cyme. **Flowers** bisexual, pedicellate. **Sepals** 5. **Petals** 5, incurved at anthesis. **Androecium** of 5 fascicles of stamens united to form a tube around ovary, and 5 united fasciclodes forming an annulus outside stamen tube. **Ovary** 5-locular; loculi (1)few- to many-ovulate; styles 5, united below, spreading above; stigmas minute. **Fruit** a 1–3-seeded berry with tough epidermis. **Seeds** large, with a fibrous aril.

Species ± 16, all confined to Madagascar except *Symphonia globulifera* L.f.; found within sthn trop. Afr. in Angola and Zambia. This species yields a resin of economic importance.

Vismia Vand.

Vandelli: 51 (1788) name conserved; Exell & Mendonça: 124 (1937/1951); Milne-Redhead: 13 (1953); Bamps: 428 (1966); Mendes: 333 (1969); Bamps: 24 (1970); Bamps *et al.*: 32 (1978).

Caopia Adans.; Hiern: 58 (1896).

Small trees, shrubs or lianes with orange latex. **Leaves** opposite, petiolate with an interpetiolar ridge, entire, ovate to elliptic, with opaque glandular dots. **Inflorescences** terminal or axillary cymes, cymose panicles or glomerules. **Flowers** bisexual, regular. **Sepals** 5, ± ovate, with longitudinal linear glands, persistent. **Petals** 5, narrowly obovate, villose within, with longitudinal linear glands or glanddots, caducous. **Interstaminal glands** 5, glabrous. **Stamens** in 5 bundles of few to many stamens opposite petals; upper part of filaments free; anthers longitudinally dehiscent. **Ovary** 5-locular; ovules 5 or more per locule, arranged in 2 rows; styles 5, free, ± persistent. **Fruit** a berry. **Seeds** many, dry; radicle very short.

Species 51, tropical America and Africa (7 spp.); sthn trop. Afr. 4, Angola, Mozambique.

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Cochlospermaceae

(Dilleniidae—Malvales)
(Eurosids II—Malvales)

Small trees or shrubs; hairs simple; leaves, sepals and petals containing red juice. **Leaves** alternate, simple, (3–)5–7-palmatilobed, ± entire, petiolate; stipules linear. **Inflorescence** terminal racemes or panicles. **Flowers** bisexual, regular, hypogynous, showy. **Sepals** 5, imbricate or contorted. **Petals** 5, free, contorted in bud, alternating with sepals, usually with red markings at base. **Stamens** many, evenly distributed or appearing fascicled; anthers slightly curved, opening by an apical pore. **Ovary** superior, (3)4(5)-carpellate, 1- or incompletely 3-locular, with placentation appearing axile at base, and parietal in upper parts of ovary; ovules many, anatropous; style simple; stigma small. **Fruit** a (3)4(5)-valved capsule; valves of membranous endocarp separating from, and alternating with those of epicarp. **Seeds** many, reniform with shallow sinus, covered with white woolly hairs; endosperm copious, oil-rich; embryo large, conforming to shape of seed, cotyledons broad.

Genera 2, species 15, tropics of America, Africa, Asia and Australia; sthn trop. Afr.: genus 1, species 1.

Planchon: 305 (1847); Exell & Mendonça: 382 (1937/1951); Verdcourt: 1 (1975); Poppendieck: 213 (1980); Takhtajan: 225 (1997).

Cochlospermum Kunth

Kunth: 6 (1822); Oliver: 112 (1868); Exell: 20 (1926) under Bixaceae; Exell & Mendonça: 77, 360 (1937/1951); Verdcourt: 1 (1975); Poppendieck: 215 (1980).

Description as for family.

Species 15, tropics of America, Africa, Asia and Australia; sthn trop. Afr. 1: *Cochlospermum angolense* Welw. ex Oliv., Angola.

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Combretaceae

(Rosidae—Myrtales)
(Rosids—Myrtales)

Bredenkamp, C.L. in Leistner: 228 (2000).

Sthn trop. Afr.: genera 8, species ± 90.

Key to genera

[based on Exell & Garcia (1970); Wickens (1973) and Exell (1978)]

1a Leaves opposite, subopposite or whorled:
  2a Lower receptacle with 2 adnate bracteoles; petals absent; mangroves ..... Laguncularia
  2b Lower receptacle without adnate bracteoles; petals present; inland woody plants:
    3a Flowers male and bisexual in the same inflorescence; minute scales and stalked glands absent ..... Pteleopsis
    3b Flowers all bisexual; minute scales and/or stalked glands are present:

4a Style adnate to the upper receptacle for part of its length; stamens not exserted beyond the petals; scales absent; microscopic stalked glands present ..... **Quisqualis**

4b Style not adnate to the upper receptacle; scales or stalked glands always present:

5a Stamens twice as many as petals; petals mostly arising near the apex of the upper receptacle ..... **Combretum**

5b Stamens 4; petals arising near the edge of the disc ..... **Meiostemon**

1b Leaves alternate, often crowded at ends of branches; flowers usually bisexual and male in the same inflorescence:

6a Petals present; lower receptacle with 2 adnate bracteoles; mangroves ..... **Lumnitzera**

6b Petals absent; inland plants or mangroves:

7a Flowers in spikes and spike-like racemes, never aggregated into tight cones; inland trees ..... **Terminalia**

7b Flowers and small fruits aggregated into tight cones; mangroves ..... **Conocarpus**

Combretum Loefl.

White: 277 (1962); Exell & Garcia: 44 (1970); Exell: 101 (1978); Jongkind: 7 (1999); White *et al.*: 194 (2001); Bingham & Smith: 140 (2002); Coates Palgrave: 790 (2002); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 163 (2002); Tilney: 166 (2002); Lebrun & Stork: 568 (2003).

Sthn trop. Afr. 61, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Conocarpus L.

Linnaeus: 176 (1753); Lawson: 417 (1871); Howes: 323 (1952); Liben: 88 (1968); Exell & Garcia: 92 (1970); Jongkind: 89 (1999).

Shrubs or trees (mangroves); bark fissured; branches subangular to narrowly winged, pubescent when young. **Leaves** alternate, petiolate, somewhat fleshy, with 2 or 4 glands at base, entire, with domatia along midrib in axils of secondary veins. **Flowers** bisexual, small, crowded in dense, cone-shaped heads borne in racemes. **Calyx**: tube compressed, truncate, not prolonged above ovary; limb urceolate, 5(6)-lobed, deciduous. **Petals** absent. **Stamens** (5)7(10), in 2 whorls, exserted; filaments filiform, glabrous. **Disc** long-pubescent. **Ovary** inferior, 1-locular; ovules 2. **Fruit** a trapezoidal, samara-like, glabrous, brownish maroon achene with a corky pericarp. **Seeds** cylindric, curved, whitish.

Species 2, seashores in tropical America and tropical W Africa; sthn trop. Afr. 1: *Conocarpus erectus* L., Angola.

Laguncularia C.F.Gaertn.

Gaertner: 209 (1807); Lawson: 419 (1871); Keay: 280 (1954); Exell & Garcia: 93 (1970); Diallo *et al.*: 337 (1995); Jongkind: 90 (1999); Lebrun & Stork: 593 (2003).

Polygamous shrubs or small trees (mangroves); branchlets glabrous. **Leaves** opposite, petiolate, coriaceous to fleshy, obovate or elliptic, glabrous; petiole with a pair of glands towards top. **Flowers** bisexual or unisexual, sessile, subpaniculate; bracts ovate; bracteoles adnate to calyx tube. **Calyx**: tube turbinate, not prolonged above ovary; limb urceolate, 5-fid, persistent. **Petals** absent, or minute and caducous. **Stamens** 10, in 2 rows, included. **Ovary** inferior, 1-locular, crowned by an epigynous disc; ovules 2. **Fruit** coriaceous, crowned by calyx limb, shortly club-shaped, subtrigonous, ribbed, shortly pubescent. **Seed** oblong-ovoid.

Species 2, Atlantic coast of tropical America and W coast of Africa from Senegal to Angola; sthn trop. Afr. 1: *Laguncularia racemosa* (L.) P.Gaertn., Angola.

Lumnitzera Willd.

Wickens: 93 (1973); Exell: 181 (1978); Coates Palgrave: 823 (2002).

Sthn trop. Afr. 1: *Lumnitzera racemosa* Willd., Mozambique, and sthn Afr.

Meiostemon Exell & Stace

Exell & Stace: 18, t. 1 (1966); Exell & Stace: 18 (1966); Exell: 223 (1970); Exell: 101 (1978); Bingham & Smith: 140 (2002); Coates Palgrave: 813 (2002); Lebrun & Stork: 594 (2003).

Deciduous scandent shrubs or more rarely small trees. **Leaves** opposite, elliptic to broadly elliptic, petiolate, lepidote, at first minutely pubescent, glabrescent. **Inflorescences** of axillary panicles. **Flowers** small, 4-merous, sessile. **Calyx**: tube shallowly campanulate, slightly oblique. **Petals** 4, arising near margin of disc. **Stamens** 4, 1-seriate, antepetalous, not exserted. **Style** scarcely exserted. **Disc** with pubescent, scarcely free margin. **Ovary** with 2 ovules. **Fruit** 4-winged. **Seeds**: cotyledons 2, unfolding spirally and arising above soil level (known only in *M. tetrandrus*). **Scales** ± 40–80 µ in diam., circular in outline, slightly convexly scalloped at each marginal cell; cells delimited by 8–10 radial walls alone; cell walls clear; cells transparent.

Species 2: SE trop. Africa 1, Madagascar 1; sthn trop. Afr. 1: *Meiostemon tetrandrus* (Exell) Exell & Stace (with 2 subspecies) in Zambia, Zimbabwe and Mozambique. This genus, being lepidote, is evidently related to *Combretum* subgen. *Combretum*. It differs conspicuously from *Combretum* in having only 4 stamens in one whorl.

Pteleopsis Engl.

White: 287 (1962); Exell & Garcia: 82 (1970); Exell: 162 (1978); White *et al.*: 194 (2001); Coates Palgrave: 813 (2002); Izidine & Bandeira: 50 (2002); Lebrun & Stork: 594 (2003).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Quisqualis L.

Exell: 174 (1928); Exell & Garcia: 85 (1970); Coates Palgrave: 815 (2002).

Sthn trop. Afr. 4, Angola, and sthn Afr.

Terminalia L.

White: 288 (1962); Exell & Garcia: 87 (1970); Exell: 166 (1978); Jongkind: 103 (1999); White *et al.*: 197 (2001); Coates Palgrave: 815 (2002).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Connaraceae

(Rosidae—Rosales)
(Eurosids I—Oxalidales)

Jordaan, M. in Leistner: 229 (2000).

Sthn trop. Afr.: genera 7, species 25.

Key to genera

[adapted from Breteler (1989)]

1a Flowers with 5 carpels:
2a Follicles (almost) glabrous; leaves mostly pinnate; seed ± without endosperm ..... **Rourea**
2b Follicles hairy (sometimes glandular):
3a Flowers with a distinct androgynophore ..... **Manotes**
3b Flowers without a distinct androgynophore:
4a Follicles hairy inside ..... **Cnestis**
4b Follicles glabrous inside:
5a Sepals strongly accrescent in fruit; leaves mostly with more than 3 leaflets ..... **Rourea**
5b Sepals inconspicuous or caducous in fruit; leaves trifoliolate ..... **Agelaea**
1b Flowers with 1 carpel:
6a Leaves unifoliolate; petals glabrous; follicles velutinous ..... **Burttia**
6b Leaves with more than 1 leaflet:
7a Petals and filaments glabrous; follicles indehiscent, 1- or 2-seeded ..... **Jollydora**
7b Petals and/or filaments with many (sometimes glandular) hairs; follicles dehiscent, 1-seeded ..... **Connarus**

Agelaea Sol. ex Planch.

Planchon: 437 (1850); Hiern: 188 (1896); Exell: 95 (1928); Exell & Mendonça: 142 (1954/1956); Mendes: 616 (1966); Mendes: 3 (1969); Jongkind: 136 (1989a); White *et al.*: 208 (2001).

Woody lianes, scandent shrubs or small trees; usually with fascicled hairs. **Leaves** 3-foliolate. **Inflorescence** a large many-flowered panicle. **Flowers** 5-merous; androecium and gynoecium heteromorphic. **Sepals** imbricate, with a dense brown indumentum, usually fringed with glandular hairs. **Petals** longer than sepals, often slightly connate near base, glabrous. **Stamens**: filaments connate at base, terete, glabrous. **Gynoecium**: carpels pilose; stigma expanded and sometimes flattened; ovules basally inserted. **Fruit** 1–3-follicular, dehiscence by ventral suture; pericarp tomentose. **Seed** ± ovoid; testa dark and shining; aril basal, obliquely cupuliform; cotyledons planoconvex, radicle apical, endosperm absent.

Species 6, 4 in trop. Africa, 2 in Asia; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Burttia Baker f. & Exell

Baker & Exell: 249 (1931); White: 71 (1962); Breteler & Brouwer: 169 (1989); Breteler & Brouwer: 1312 (1992); Bingham & Smith: 140 (2002).

Shrubs or small trees; branches greyish brown, pubescent when young, later pale grey with many lenticels. **Leaves** 1-foliolate, long-petioled, deciduous; petiole slender, articulated at apex,

densely ferruginous-hairy when young, later glabrescent; lamina broadly ovate to elliptic. **Inflorescence** a simple, 1–3-flowered axillary raceme. **Flowers** (4)5-merous with androecium and gynoecium dimorphic; pedicel articulate. **Sepals** 5, imbricate in bud, very shortly connate at base. **Petals** 5, free, subequal, larger than sepals. **Stamens** 10, 5 antesepalous ones longer than 5 antepetalous ones. **Gynoecium**: ovary sessile, densely sericeous; style glabrous; stigma papillose; ovules (1)2(3), arising near apex of ventral suture. **Follicle** flattened, with persistent calyx (and stamens), 1-seeded, densely pubescent, dehiscing by ventral suture. **Seed** narrowly ovoid, attached near top of ventral suture; aril lobate, spreading laterally from sides of hilum and covering entire length of one side of seed; embryo straight; cotyledons flattened; endosperm copious.

Monotypic: *Burttia prunoides* Baker f. & Exell, trop. Africa, Tanzania, and sthn trop. Afr.: Zambia, Mozambique.

Cnestis Juss.

Hiern: 190 (1896); Exell & Mendonça: 137 (1954/1956); Mendes: 615 (1966); Mendes: 2 (1969); Lemmens: 174 (1989a); Coates Palgrave: 252 (2002); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. 4, Angola, Zimbabwe, Mozambique, and sthn Afr.

Connarus L.

Linnaeus: 675 (1753); Hiern: 189 (1896); Exell: 98 (1928); Exell & Mendonça: 152 (1954/1956); Lemmens: 239 (1989b).

Lianas or lianescent shrubs with cylindric branches. **Leaves** trifoliolate or imparipinnate; leaflets opposite or not, often acuminate, often glandular-punctate. **Inflorescence** an axillary panicle, often appearing terminal and more compound due to reduced leaf development. **Flowers** bisexual, heterostylous; pedicels with a distinct joint. **Sepals** 5, connate at base, imbricate or valvate in bud, thin to somewhat fleshy, usually glandular-punctate. **Petals** 5, longer than sepals, free or coherent, usually white, imbricate in bud, usually ± pilose outside, often with glandular hairs inside. **Stamens** 10, all fertile, episepalous ones fertile, epipetalous ones shorter and fertile, sterile or rudimentary; filaments united at base, longer ones usually with stipitate glands; anthers sometimes with glandular hairs at apex. **Carpel** 1; style often pilose and with stipitate glands. **Follicle** red, opening lengthwise, usually along ventral suture, initially pubescent outside, glabrous or pilose and often with glands inside, often stipitate, usually with a short apical mucro. **Seed** solitary, attached to ventral side of follicle, ovoid or slightly kidney-shaped; testa shiny black, yellow and fleshy (sarcotesta) below hilum; endosperm absent; hilum lateral; radicle apical, dorsal or almost in centre of seed between cotyledons; cotyledons thick, planoconvex.

Species ± 77, circumtropical; sthn trop. Afr. 3, Angola.

Jollydora Pierre ex Gilg

Gilg: 217 (1896); Exell & Mendonça: 137 (1954/1956); Breteler & Van Ziel: 284 (1989).

Small, evergreen, usually unbranched treelets; young parts reddish to light brown woolly, silky or tomentose. **Leaves** usually imparipinnate, sometimes paripinnate, mostly crowded near top; leaflets 5–11, opposite to alternate, elliptic to obovate or oblong, cuneate at base, long-acuminate, petiolulate. **Inflorescence** 1–several, up to 7-flowered clustered racemes on old wood, rarely axillary; pedicel articulate, with 1 small bract and 2 opposite bracteoles, cauliflorous. **Flowers** heterostylous. **Sepals** 5, free, imbricate, unequal: outer 2 smaller. **Petals** 5, free or somewhat coherent, imbricate. **Stamens** 10, united at base into a ± conspicuous cup partly enclosing ovary; filaments glabrous. **Carpel** 1; ovary ellipsoid, pubescent; style ± glabrous; stigma usually slightly lobed. **Fruit** 1- or 2-seeded, obovoid-ellipsoid to subglobose, shortly stipitate; pericarp shiny, glabrous or glabrescent. **Seeds** 1 or 2 per fruit; testa almost completely fleshy; cotyledons thick and almost horny, radicle minute.

Species 3, W trop. Africa; sthn trop. Afr. 1: *Jollydora duparquetiana* (Baill.) Pierre, Angola (Cabinda).

Manotes Sol. ex Planch.

Planchon: 438 (1850); Hiern: 189 (1896); Exell & Mendonça: 140 (1954/1956); Jongkind: 294 (1989b).

Lianas or scandent shrubs; branches cylindric or very slightly lobed, usually densely tomentose when young, glabrous and lenticellate later. **Leaves** imparipinnate; leaflets 7–13, opposite or subopposite, entire, ± symmetric. **Inflorescences** axillary, paniculate or racemose. **Flowers** hetero-tristylous or hetero-distylous, reddish to yellow; with short but distinct androgynophore. **Sepals** 5, connate at base, valvate in bud. **Petals** 5, free, longer than sepals, imbricate in bud. **Stamens** free, in 2 whorls: 5 stamens opposite sepals longer than 5 opposite petals. **Pistils** 5, free, pubescent. **Follicles** 1–5 per flower, constricted at base, beaked or not, glabrous inside, dehiscing by a ventral suture to expose pendulous seed; inner pericarp separating from exocarp at maturity; calyx persistent and usually accrescent in fruit. **Seed** solitary, subovoid, attached to ventral suture; testa (sarcotesta) shiny, red and ± fleshy, to partly thin and black.

Species 4, W and C trop. Africa; sthn trop. Afr. 2, Angola.

Rourea Aubl.

Hiern: 186 (1896); White: 72 (1962); Jongkind: 310 (1989c); White *et al.*: 208 (2001); Coates Palgrave: 252 (2002); Izidine & Bandeira: 50 (2002).

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Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Convolvulaceae
(including Cuscutaceae)
(Asteridae—Solanales)
(Euasterids I—Solanales)

Welman, W.G. in Leistner: 231 (2000).

Sthn trop. Afr.: genera 23 or 24, species ± 152.

Key to genera

1a Leaves minute, scale-like or absent; herbaceous, yellowish twining parasites; flowers small, usually in clusters, often many ..... **Cuscuta**

1b Leaves well-developed, green:

2a Ovary distinctly 2- or 4-lobed or -cleft; styles 2, arising between the lobes of the ovary; prostrate herbs with oblong or cordate to reniform leaves:

3a Ovary 2-cleft, with 2 ovules in each locule; fruit 2-lobed ..... ***Dichondra**

3b Ovary 4-cleft, with 1 ovule in each locule; fruit 4-lobed ..... **Falkia**

2b Ovary not deeply lobed; fruit not 2- or 4-lobed; styles 1 or 2, terminal; plants of various habits:

4a Bracteole at base of calyx markedly enlarged in fruit; climbing shrubs or immense lianes ..... **Neuropeltis**

4b Bracteoles not markedly enlarging in fruit; rarely climbing shrubs, never immense lianes:

5a Outer 2 sepals much enlarged in fruit:

6a Stigmas ellipsoid or globose ..... **Calycobolus**

6b Stigmas linear-oblong ..... **Dipteropeltis**

5b Outer 2 sepals not much enlarged in fruit:

7a Styles 2, free to partly united:

8a Styles forked; stigmas 4, linear or subclavate ..... **Evolvulus**

8b Styles not forked; stigmas 2, peltate or capitate:

9a Styles joined for ± half their length; large climbing shrubs ..... **Bonamia**

9b Styles free or almost so; small erect or prostrate subshrubs:

10a Stamens and styles included ..... **Seddera**

10b Stamens and styles exserted ..... **Cressa**

7b Style 1; stigma(s) globose to linear:

11a Stigmas long and linear, ± as thick as the styles ..... **Convolvulus**

11b Stigma capitate, entire, or style ending in 2 or 3 globular or oblong, rarely filiform stigmas:

12a Indumentum conspicuously stellate-hairy ..... **Astripomoea**

12b Indumentum not stellate-hairy (except in *Merremia stellata* and *Ipomoea ephemera*) but sometimes with a few scattered branched hairs:

13a Stigmas oblong or nearly so, rarely filiform:

14a Leaves rounded at the base; 3 outer sepals largest and decurrent onto the petiole; a marsh plant of the coast with usually solitary flowers ..... **Aniseia**

14b Leaves cordate, hastate or cuneate at the base; sepals equal or unequal, not decurrent; plant of various habitats (not as above), with few-flowered capitate inflorescences:

15a Stigmas subglobose to filiform, usually oblong or elliptic; corolla usually blue but sometimes white or pink, ±10 mm long ..... **Jacquemontia**

15b Stigmas ovate-oblong, complanate; corolla yellow, rarely white, usually with maroon or claret centre, 20–35 mm long ..... **Hewittia**

13b Stigmas globose or nearly so:

16a Corolla urceolate, constricted at the apex of the tube ..... **Lepistemon**

16b Corolla not distinctly urceolate:

17a Pollen smooth; corolla nearly always yellow or white, with or without a red or purple eye:

18a Fruit a large capsule with circumscissile epicarp ..... **Operculina**

18b Fruit a 4-valved capsule:

19a Anthers at anthesis helically twisted; pollen tricolpate; leaves usually palmately or pinnately compound ..... **Merremia**

19b Anthers at anthesis straight; pollen pantoporate; leaves oblong to linear-lanceolate, much longer than broad, with hastate, sagittate or truncate base ..... **Xenostegia**

17b Pollen spinulous; corolla variously coloured, often purple:

20a Fruit completely enclosed by the much enlarged calyx; pericarp thin, opening irregularly; seeds 4; leaves with dense black glandular dots on the lower surface ..... **Stictocardia**

20b Fruit dehiscent or indehiscent, not as above; leaves without black glandular dots below:

21a Stamens arising on scales situated near the base of the corolla tube; style completely caducous in fruit ..... **Paralepistemon**

21b Stamens arising directly on the corolla tube; style not completely caducous in fruit:

22a Fruit a 3–10-valved capsule ..... **Ipomoea**

22b Fruit indehiscent, ovoid-oblong or ellipsoid ..... **Turbina**

Aniseia Choisy

Choisy: 481 (1834); Good: 110 (1929); Verdcourt: 48 (1963); Gonçalves: 33 (1987); Gonçalves: 32 (1992); Lejoly & Lisowski: 376 (1993).

Twining perennial herbs; stems sometimes rooting below. **Leaves** alternate, petiolate, narrowly elliptic, often mucronulate. **Flowers** solitary, axillary. **Calyx** of 5 unequal sepals, 3 outer ones much larger, ovate and ± decurrent on peduncle. **Corolla** funnel-shaped, usually entire, with well-defined hairy midpetaline bands. **Stamens** 5, arising at base of corolla tube, included; pollen smooth. **Disc** small or absent. **Ovary** 2-locular with 2 ovules in each locule; style simple, included; stigmas 2, thick, oblong. **Fruit** a 4-valved, ovoid or globose capsule. **Seeds** 4, trigonous or globose, black.

Species ± 5, pantropical, 1 in N sthn trop. Afr.: *Aniseia martinicensis* (Jacq.) Choisy, Angola, Mozambique.

Astripomoea A.Meeuse

White: 361 (1962); Gonçalves: 51 (1987); Gonçalves: 54 (1992); Lejoly & Lisowski: 387 (1993); Meeuse & Welman: 66 (2000).

Astrochlaena Hallier f. not of Corda.

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bonamia Thouars

Gonçalves: 19 (1987); Lejoly & Lisowski: 361 (1993); Meeuse & Welman: 29 (2000).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Calycobolus Willd. ex Schult.

Heine: 387 (1963a); Heine: 337 (1963b); Lejoly & Lisowski: 27 (1985); Breteler: 184 (1995).

Prevostea Choisy; Baker & Rendle: 81 (1905); Good: 112 (1929).

Climbing shrubs. **Leaves** alternate, simple, entire, petiolate, large, ± elliptic, subcoriaceous. **Inflorescences** terminal or axillary, cymose or fascicled. **Flowers** rather small; bracts not accrescent. **Sepals** 5, ovate to suborbicular, outer 2 strongly accrescent in fruit forming large orbicular, membranous wings, one much larger than the other. **Corolla** urn- or bell-shaped, usually white; lobes spreading. **Stamens** included; filaments glabrous or thinly pubescent, fused to corolla in lower part and often flattened. **Ovary** 2-locular, glabrous or pubescent; ovules 2 per locule; style included, mostly unequally bifid, sometimes almost to middle; stigmas globose, kidney-shaped or ellipsoid. **Fruit** indehiscent, 1-seeded.

Species 30, tropical America (4 spp.), trop. Africa (25 spp.), Madagascar (1 sp.); sthn trop. Afr. 5, Angola.

Convolvulus L.

Gonçalves: 26 (1987); Lejoly & Lisowski: 370 (1993); Meeuse & Welman: 35 (2000).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cressa L.

Linnaeus: 223 (1753); Hiern: 724 (1998); Verdcourt: 33 (1963); Gonçalves: 21 (1987); Gonçalves: 19 (1992).

Much-branched, short-lived perennials; stems woody at base, with many spreading or ascending, hairy, densely leafy branchlets. **Leaves** small, sessile, ovate-lanceolate to ovate,

entire. **Flowers** small, subsessile, in bracteate clusters at tips of branchlets. **Calyx** with 5 subequal, obovate, coriaceous, imbricate sepals. **Corolla** 5-lobed; tube campanulate; lobes ovate, imbricate, spreading. **Stamens** 5, exserted; filaments filiform, glabrous; anthers oblong. **Ovary** 2-locular, with 2 ovules in each locule; styles 2, exserted; stigmas large, capitate. **Fruit** a 2–4-valved capsule, usually 1-seeded. **Seeds** ovoid, glabrous and shiny, dark brown.

Probably monotypic, pantropical: *Cressa cretica* L., Angola, Mozambique.

Cuscuta L.

Gonçalves: 130 (1987) under Cuscutaceae; Gonçalves: 4 (1990) under Cuscutaceae; Meeuse & Welman: 3 (2000).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Dichondra J.R.Forst. & G.Forst.

Forster & Forster: 39, t. 20 (1776); Gonçalves: 10 (1987); Lejoly & Lisowski: 353 (1993); Meeuse & Welman: 16 (2000).

Sthn trop. Afr. 1: **Dichondra micrantha* Urb. (= **D. repens* not of J.R.Forst. & G.Forst.), widespread weed recorded from Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dipteropeltis Hallier f.

Hallier: 3 (1899); Baker & Rendle: 84 (1905); Good: 111 (1929); Lejoly & Lisowski: 366 (1993); Breteler: 183 (1995).

Woody climbers. **Leaves** alternate, petiolate, ± elliptic-ovate, entire. **Inflorescences** narrow, terminal or axillary panicles, bearing remote, solitary or paired cincinnous cymes; bracts and bracteoles small, usually early caducous. **Flowers** small, pedicellate. **Sepals** 5, ± free, imbricate, unequal: outer 2 ovate, longer and broader than inner 3, strongly accrescent and finally orbicular-reniform, looking like wings of the capsule. **Corolla** funnel-shaped to campanulate, shallowly to deeply 5-lobed. **Stamens** arising low down in corolla tube; filaments filiform; anthers oblong. **Ovary** conical, 1-locular; ovules 2; style deeply bifid; stigmas linear-oblong to subcapitate. **Capsule** ovoid-conical, small, surrounded by accrescent calyx.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola.

Evolvulus L.

Good: 111 (1929); Gonçalves: 12 (1987); Lejoly & Lisowski: 357 (1993); Meeuse & Welman: 22 (2000).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Falkia Thunb.

Gonçalves: 12 (1987); Lejoly & Lisowski: 355 (1993); Meeuse & Welman: 19 (2000).

Sthn trop. Afr. 1: *Falkia oblonga* Bernh. ex Krauss, Zambia, Mozambique, and sthn Afr.

Hewittia Wight & Arn.

Gonçalves: 30 (1987); Lejoly & Lisowski: 373 (1993); Meeuse & Welman: 52 (2000); White *et al.*: 211 (2001).

Shutereia Choisy; Hiern: 726 (1898). *Eremosperma* Chiov.: 143 (1936).

Perhaps monotypic: *Hewittia malabarica* (L.) Suresh (=*H. scandens* (Milne) Mabb.); sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ipomoea L.

Good: 108 (1929); Gonçalves: 55 (1987); Gonçalves: 58 (1992); Lejoly & Lisowski: 36 (1992); Welman *et al.*: 100 (1999); Meeuse & Welman: 70 (2000); White *et al.*: 211 (2001); Bingham & Smith: 141 (2002); Mapaura & Timberlake: 163 (2002).

Mina Cerv.; Gonçalves: 46 (1987). *Turbina* in sense of A.Meeuse: 773 (1957); Gonçalves: 123 (1987); Austin & Staples: 267 (1991); Gonçalves: 126 (1992), possibly excluding *T. longiflora* Verdc.: 121 (1967).

Sthn trop. Afr. 86, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Jacquemontia Choisy

Good: 111 (1929); Gonçalves: 22 (1987); Lejoly & Lisowski: 368 (1993); Meeuse & Welman: 32 (2000).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lepistemon Blume

Blume: 722 (1826); Verdcourt: 63 (1963); Gonçalves: 44 (1987); Gonçalves: 49 (1992); Lejoly & Lisowski: 381 (1993); White *et al.*: 213 (2001).

Climbing perennials; stems up to 3 m long, covered with long, adpressed, yellow-brown, bristly hairs. **Leaves** cordate-ovate, petiolate, entire to lobed to coarsely dentate. **Flowers** in dense axillary, sessile or peduncled cymes; bracteoles minute. **Calyx** of 5 subequal sepals, herbaceous or subcoriaceous, acute or obtuse, hairy or glabrous. **Corolla** urceolate; tube narrowing upwards; limb shortly 5-lobed. **Stamens** 5, arising near base of corolla; filaments dilated in basal portion into large, concave scales arching over ovary; pollen spinulose. **Ovary** 2-locular, with 2 ovules in each locule; style 1, very short; stigmas 2, capitate, or 1, and then 2-lobed. **Fruit** a 4-valved or almost indehiscent capsule. **Seeds** ± globose, minutely shallowly pitted, glabrous, grey-black.

Species ± 10, Old World tropics; 1 in sthn trop. Afr.: *Lepistemon owariense* (Beauv.) Hallier f., Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Merremia Dennst. ex Endl.

Good: 110 (1929); Gonçalves: 34 (1987); Gonçalves: 34 (1992); Lejoly & Lisowski: 25 (1992); Meeuse & Welman: 55 (2000).

Sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Neuropeltis Wall.

Wallich: 43 (1824); Baker & Rendle: 80 (1905); Good: 114 (1929); Heine: 338 (1963); Lejoly & Lisowski: 472 (1984).

Climbing shrubs to immense lianas up to 40 m high and a stem diameter up to 300 mm; young branches and axes of inflorescence often densely pubescent. **Leaves** alternate, petiolate, mucronate, entire. **Inflorescences**: racemes or panicles,

terminal or in axils of upper leaves; bracts small, lanceolate, soon caducous. **Flowers** small, shortly pedicellate; bracteole solitary at base of calyx, strongly accrescent after anthesis. **Sepals** 5, subequal, almost free, imbricate. **Corolla** ± deeply 5-lobed, lobes with hyaline margin. **Stamens** arising on corolla tube; filaments filiform, widening towards base, ± as long as corolla; anthers oblong, medifixed; pollen grains smooth. **Disc** very small. **Ovary** imperfectly 2-locular; ovules 4; styles 2, free, equal or subequal; stigma peltate or 2-branched. **Capsule** coriaceous, orbicular to ovoid, 1(2)-seeded, surrounded at base by persistent calyx. **Seed** globose, glabrous; embryo plicate.

Species 13: 4 in tropical Asia, 9 in trop. Africa; sthn trop. Afr. 4, Angola.

Operculina Silva Manso

Manso da Silva: 16 (1836); Verdcourt: 61 (1963); Gonçalves: 44 (1987); Gonçalves: 47 (1992).

Large perennial twiners; stems, peduncles and petioles often winged. **Leaves** very variable, orbicular to lanceolate, cordate, hastate or truncate at base, entire or rarely lobed or dentate. **Flowers** usually large, in 1- to few-flowered axillary cymes; bracts large, oblong or elliptic, caducous. **Calyx** of 5 large, pergamentaceous to coriacous, mostly glabrous sepals, often enlarged in fruit and ultimately with an irregularly lacerate margin. **Corolla** broadly funnel-shaped or campanulate. **Stamens** 5, included; anthers large, often longitudinally twisted; pollen ellipsoid, smooth. **Ovary** 2-locular, each locule with 2 ovules; style simple; stigma biglobular. **Fruit** a large, depressed-globose capsule with circumscissile epicarp, the upper part coming off as an operculum. **Seeds** up to 4, ± globose, pilose or glabrous, black.

Species ± 15, pantropical; sthn trop. Afr. 1: *Operculina turpethum* (L.) Silva Manso, Mozambique. Very close to *Merremia* but with a differently dehiscing capsule.

Paralepistemon Lejoly & Lisowski

Lejoly & Lisowski: 195 (1986); Gonçalves: 127 (1987); Lejoly & Lisowski: 271 (1987); Austin & Staples: 267 (1991); Gonçalves: 132 (1992); Meeuse & Welman: 121 (2000).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Seddera Hochst.

Good: 111 (1929); Gonçalves: 16 (1987); Meeuse & Welman: 25 (2000).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stictocardia Hallier f.

Gonçalves: 48 (1987); Gonçalves: 51 (1992); Lejoly & Lisowski: 384 (1993); Austin & Sebsebe Demissew: 161 (1997); Meeuse & Welman: 124 (2000); White *et al.*: 214 (2001).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Turbina Raf. (Occurrence of genus uncertain).

Gonçalves: 123 (1987); Austin & Staples: 267 (1991); Gonçalves: 126 (1992); Lejoly & Lisowski: 392 (1993).

Of the species cited in these references only *Turbina longiflora* Verdc., only known from Mozambique, may possibly belong to *Turbina*; all other species mentioned have been returned to *Ipomoea*. *T. longiflora* is also referred to in Izidine & Bandeira: 50 (2002).

Turbina is similar to *Ipomoea* but has an indehiscent ovoid-oblong or ellipsoid fruit, mostly with a single puberulous seed. Seeing that the fruit of *T. longiflora* is not known, its generic placing is uncertain.

Xenostegia D.F.Austin & Staples

Austin & Staples: 533 (1980); Lejoly & Lisowski: 379 (1993); Meeuse & Welman: 63 (2000).

Merremia Dennst. ex Endl. in part; Good: 111 (1929); Verdcourt: 51 (1963); Gonçalves: 35 (1987); Gonçalves: 36 (1992).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Cornaceae

(Asteridae—Cornales)
(Asterids—Cornales; Alangiaceae included in Cornaceae)

Archer, R.H. in Leistner: 234 (2000).

Sthn trop. Afr.: genera 2, species 2.

Additional family characters and **identification of additional genus (Afrocrania)**: Dioecious trees. Inflorescences terminal, protected by 4 deciduous bracts.

Afrocrania (Harms) Hutch.

Hutchinson: 89 (1942); Bamps: 1 (1971); Cannon: 637 (1978); Coates Palgrave: 859 (2002).

Cornus L., in part; Mabberley: 184 (1997); White *et al.*: 216 (2001).

Dioecious trees. **Leaves** narrowly elliptic to lanceolate, both surfaces with fine adpressed pubescence when young, later glabrescent, petiolate. **Inflorescences** at first enclosed within 4 deciduous herbaceous bracts which provide protection for developing flowers. **Flowers** unisexual. **Male flowers** arranged in cymules forming dense terminal clusters; petals 4, valvate; stamens 4, without filaments; pistillode with abortive, narrowly conical style. **Female flowers** in terminal umbels; petals 4, valvate; staminodes 4, alternating with petals; ovary 2-locular with 1 ovule in each locule. **Fruit** drupaceous with shrivelled remains of calyx and style at apex.

Monotypic genus: *Afrocrania volkensii* (Harms) Hutch., confined to E and SE trop. Africa; sthn trop. Afr.: Zimbabwe, Malawi, Mozambique.

Curtisia Aiton

Cannon: 635 (1978); Coates Palgrave: 858 (2002).

Sthn trop. Afr. 1: *Curtisia dentata* (Burm.f.) C.A.Sm., Zimbabwe, Mozambique, and sthn Afr.

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Crassulaceae

(Rosidae—Rosales)
(Core Eudicots—Saxifragales)

Dreyer,L.L. & Makwarela, A.M. in Leistner: 235 (2000).

Sthn trop. Afr.: genera 4, species 57.

*Bryophyllum Salisb.

Fernandes: 33 (1982a); Fernandes: 33 (1982b); Fernandes: 66 (1983).

Sthn trop. Afr. 4, Angola, Zimbabwe, Malawi, Mozambique; introduced, probably from Madagascar, and naturalised in some areas in Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cotyledon L.

Hiern: 329 (1896); Fernandes: 35 (1982a); Fernandes: 35 (1982b); Fernandes: 70 (1983).

Sthn trop. Afr. 3, Angola, Zimbabwe, Mozambique, and sthn Afr.

Crassula L.

Hiern: 325 (1896); Fernandes: 165 (1978); Fernandes: 5 (1982a); Fernandes: 5 (1982b); Fernandes: 4 (1983); Percy-Lancaster & Richards: 72 (1992); Coates Palgrave: 239 (2002); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 163 (2002); Lebrun & Stork: 208 (2003).

Tillaea L.: Hiern: 324 (1896).

Sthn trop. Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Kalanchoe Adans.

Hiern: 326 (1896); Fernandes: 199 (1978); Fernandes: 15 (1982a); Fernandes: 15 (1982b); Fernandes: 41 (1983); Izidine & Bandeira: 50 (2002).

Sthn trop. Afr. 27, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Ctenolophonaceae

(Rosidae—Linales)
(Eurosids I—Malpighiales)

Trees with stellately tufted and simple hairs on young shoots and stipules, and on outside of sepals and petals. **Leaves** opposite, simple, petiolate, coriaceous, entire; stipules interpetiolar, fused in pairs, caducous. **Inflorescence** cymose to racemose. **Flowers** bisexual, regular. **Sepals** 5, slightly fused at base, imbricate, persistent. **Petals** 5, imbricate, thick, caducous. **Stamens** 10, free, adnate at base halfway up to inner surface of an extrastaminal nectary disc, epipetalous ones slightly shorter than episepalous ones; anthers bithecous, ovate, introrse, opening by longitudinal slits, connective apiculate. **Ovary** superior, 2-locular; ovules 2 per locule, pendent from apical-axile placenta on fairly long funicles, anatropous, bitegmic; style 1, apically bifurcate; stigmas 2, discoid. **Fruit** a longitudinally dehiscent capsule. **Seed** 1, persistent and pendulous on long funicle after falling of pericarp; embryo straight; endosperm copious.

Genus 1, species 3, trop. Africa and Malesia. The family is often placed under Linaceae.

Winkler: 122 (1931) as Ctenolophonoideae under Linaceae; Exell & Mendonça: 248, 392 (1951); Van Hooren & Nooteboom: 547 (1984); Takhtajan: 320, 322 (1997).

Ctenolophon Oliv.

Oliver: 516 (1873); Winkler: 122 (1931); Exell & Mendonça: 248 (1951); Keay: 357 (1958), Badré: 43 (1973).

Description as for family.

Species 3, trop. Africa and Malesia; sthn trop. Afr. 1: *Ctenolophon englerianus* Mildbr., Angola.

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Cucurbitaceae

(Dilleniidae—Violales)
(Eurosids I—Cucurbitales)

Welman, W.G. in Leistner: 237 (2000).

Sthn trop. Afr.: genera 28, species 116.

Key to genera

[adapted from Jeffrey (1978)]

1a Tendrils distally 2-fid; styles 3:
2a Stamen 1, central, with thecae ring-like; ovary compressed, containing 1 ovule ..... **Cyclantheropsis**
2b Stamens 4 or 5, with thecae short, straight; ovary trigonous, containing several ovules ..... **Gerrardanthus**
1b Tendrils simple or proximally 2–5-fid:
3a Tendrils represented by spines ..... **Acanthosicyos**
3b Tendrils evident, coiling:
4a Leaves compound:
5a Petals purplish, fringed with filaments ..... **Telfairia**
5b Petals cream, yellow or orange, not fringed ..... **Momordica**
4b Leaves simple (though sometimes deeply lobed) or absent:
6a Young stems spotted with darker green:
7a Petals free, at least 1 with an incurved basal scale; ovary spiny ..... **Momordica**
7b Petals shortly united, without basal scales; ovary smooth ..... **Diplocyclos**
6b Young stems concolorous (though sometimes calloso-punctate):
8a Base of leaf lamina or apex of petiole with a pair of lateral glands:
9a Ovary and fruit with many horizontal ovules/seeds on 3 placentas ..... **Lagenaria**
9b Ovary and fruit with (1)2 or 3 erect ovules/seeds in each of 3 locules ..... **Cayaponia**
8b Base of leaf lamina and apex of petiole without a pair of glands:
10a Leaves with subcircular, ciliate bracts at the base of some or all petioles:
11a Flowers very small; petals ± 1 mm long; seeds usually 2 ..... **Ctenolepis**
11b Flowers larger; petals 2 mm and much longer; seeds more than 2:
12a Anther thecae triplicate; petals often linear and 10 mm long or longer; seeds rounded ..... **Trochomeria**
12b Anther thecae duplicate; petals never linear, ± 2 mm long; seeds angular ..... **Dactyliandra**
10b Leaves without subcircular bracts:
13a Tendrils 3–5-fid:
14a Flowers small; receptacle lobes 1 mm long or shorter; petals in male flowers 2–3 mm long; female flowers mostly clustered in heads ..... ***Sicyos**
14b Flowers larger; receptacle lobes 2 mm or longer; petals in male flowers 6 mm or longer; female flowers mostly solitary:
15a Male flowers solitary; ovary villous; petals 7–19 mm long ..... **Citrullus**
15b Male flowers racemose; ovary densely puberulous; petals 20–45 mm long ..... **Luffa**
13b Tendrils simple or 2-fid:
16a Tendrils 2-fid:
17a Anther thecae curved like a bow; placentas and stigmas 2 ..... **Kedrostis**
17b Anther thecae triplicate or contorted; placentas and stigmas 3 or 5:
18a Stamens 5, all 1-thecous; placentas and stigmas 5; female inflorescences racemose ..... **Bambekea**
18b Stamens 3, all 2-thecous, or two 2-thecous and one 1-thecous; placentas and stigmas 3:
19a Male and female flowers in axillary clusters, often co-axillary ..... **Diplocyclos**
19b Male and female flowers solitary or racemose, not co-axillary:
20a Leaf lobes pinnately lobulate, often deeply so ..... **Citrullus**
20b Leaf lobes not pinnately lobulate, broadly triangular to elliptic, not lobulate or shortly 3-lobulate:
21a Receptacle tube obconic to campanulate, and 2–7(–15) mm long in male flowers, shortly cylindric and 2–5 mm long in female flowers; anther thecae laxly triplicate; connectives broad; anther head ± spherical ..... **Coccinia**
21b Receptacle tube in male and female flowers narrowly funnel-shaped or ± cylindric, often with a somewhat inflated base or middle:
22a Leaves palmately lobed with scattered disc glands on the lower surface; stamens included; anthers connate into a narrow cylindric head ..... **Peponium**
22b Leaves ± entire, ovate-cordate to hastate, glabrous on both surfaces; stamens exserted; anthers free ..... **Cogniauxia**
16b Tendrils simple:

23a Corolla star-shaped, the lobes linear, spreading to reflexed, tapering from base to apex, 5–60 mm long, united only at the base, greenish yellow ..... **Trochomeria**

23b Corolla not as above:

24a Disc obvious, free from the receptacle tube laterally, shortly ± cylindric in male flowers, annular around base on female flowers:

25a Stamens 2 or 3, all 2-thecous; ovary smooth, glabrous or nearly so ..... **Zehneria**

25b Stamens 3, two 2-thecous, one 1-thecous; ovary tuberculate, papillose or spiny or, if smooth, then setulose, aculeate, hispid or tomentose:

26a Male and female flowers subsessile, in axillary clusters ..... **Mukia**

26b Male and female flowers distinctly pedicellate, the male solitary or fasciculate, the female solitary:

27a Ovary tuberculate, setulose, with the tubercles themselves both laterally and apically setulose; receptacle tube densely setulose; setulae often brownish; anther thecae straight ..... **Oreosyce**

27b Ovary smooth, aculeate, hispid or tomentose, or with numerous fleshy spines, papillae or tubercles each ending in a hyaline setula, but otherwise glabrous; anther thecae triplicate, or, if straight or merely apically replicate, then receptacle tube shortly hispid:

28a Anther thecae triplicate; ovary softly spiny, papillose or tuberculate, or if smooth, then stems and petioles coarsely spreading-setulose or stalk of ovary rapidly elongating after flowering and burying the developing fruit ..... **Cucumis**

28b Anther thecae straight or apically replicate; ovary smooth, finely hispid to aculeate-setose ... **Cucumella**

24b Disc obscure, indistinct from the base of the receptacle tube or absent:

29a Placentas and stigmas 2:

30a Male flowers in lax panicles or rather lax to rarely dense racemes; petals 2–5 mm long; female flowers with ovary not developing a cupuliform base ..... **Kedrostis**

30b Male flowers in congested, racemiform or subcapitate, pedunculate or rarely subsessile clusters; petals 0.7–2.0 mm long; female flowers with ovary developing a cupuliform base ..... **Corallocarpus**

29b Placentas and stigmas 3:

31a Petals united $^1/_2$-way up or further:

32a Ovary densely setose; plants monoecious ..... **Raphidiocystis**

32b Ovary glabrous or almost so; plants dioecious ..... **Coccinia**

31b Petals free or only shortly united:

33a Stamens 5: 4 in 2 pairs, 1 single; petals free ..... **Eureiandra**

33b Stamens 3: two 2-thecous, one 1-thecous; petals united towards base:

34a Male inflorescence racemose or paniculate; stamens and staminodes arising in throat of receptacle tube; anther thecae straight, apically hooked ..... **Cucumeropsis**

34b Male flowers solitary; stamens and staminodes arising at base of receptacle tube; anther thecae bent ..... **Citrullus**

Acanthosicyos Welw. ex Hook.f.

Fernandes & Fernandes: 278 (1970); Jeffrey: 433 (1978); Jeffrey & Fernandes: 33 (1986); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Bambekea Cogn.

Cogniaux: 115 (1916); Keay: 208 (1954); Keraudren: 90 (1967); Fernandes & Fernandes: 273 (1970).

Glabrous, dioecious annual climbing herbs; tendrils 2-fid. **Leaves** ovate-cordate, subentire to deeply palmati-5-lobed, petiolate. **Male flowers** in 10–20-flowered racemes; pedicels spreading; receptacle saucer-shaped; sepals 5, triangular, reflexed; petals 5, free, obovate, entire; stamens 5, arising at bottom of receptacle; filaments free; anthers at first cohering in a globose head, later free, 1-thecate, thecae triplicate, linear, irregularly flexuose, connective slightly enlarged; pistillode absent. **Female flowers** similar to male flowers; staminodes 5, linear-subulate; ovary ovoid, glabrous; style elongate; stigmas 5. **Fruit** globose to obovoid, glabrous, containing many horizontal, not margined seeds.

Species 2, tropical W and C Africa; sthn trop. Afr. 1: *Bambekea racemosa* Cogn., Angola (Cabinda).

Cayaponia Silva Manso

Manso da Silva: 31 (1836); Keay: 206 (1954); Keraudren: 118 (1967); Fernandes & Fernandes: 288 (1970); Jeffrey: 201 (1971).

Monoecious, perennial, slender climbers up to 7 m; branches scabrid; tendrils mostly simple. **Leaves** triangular-ovate, shallowly 3-palmatilobed, 3-nerved, with a sessile gland on each side of decurrent base, shortly dentate, acute, scabrid; petiole slender, twining, ± half as long as lamina. **Male flowers** axillary, solitary or fasciculate; receptacle campanulate to subcylindric; sepals 5, small, triangular; corolla campanulate, petals 5, fused at base, obovate; stamens 3: two 2-thecous, one 1-thecous; filaments free, linear; anthers extrorse, thecae triplicate; pistillode absent. **Female flowers** solitary or fascicled; pedicel thin; perianth similar to male but corolla lobes longer and fused to a greater height; ovary ovoid, 3-locular with 1 erect ovule per locule; style straight or slightly curved, surrounded at base by 3 flattened nectary glands, stigmas cordate; staminodes 3, short, tongue-shaped, arising at base of receptacle. **Fruit** dry, shortly stalked, ellipsoid, glabrous, finely reticulate with very thin, brittle pericarp, containing 3 erect seeds. **Seeds** erect, ovoid.

Species 46, tropical America, 2 in trop. Africa; sthn trop. Afr. 1: *Cayaponia multiglandulosa* R.Fern., Angola, but this is probably not specifically dis-

tinct from the other African species: *C. africana* (Hook.f.) Exell [Jeffrey: 225 (1971)].

Citrullus Eckl. & Zeyh.

Fernandes & Fernandes: 275 (1970); Jeffrey: 435 (1978); Jeffrey & Fernandes: 36 (1986).

Sthn trop. Afr. 1: *Citrullus lanatus* (Thunb.) Matsum. & Nakai, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Coccinia Wight & Arn.

Fernandes & Fernandes: 279 (1970); Jeffrey: 442 (1978); Jeffrey & Fernandes: 43 (1986); White *et al.*: 217 (2001); Izidine & Bandeira: 50 (2002).

Physedra Hook.f.; Norman: 196 (1929).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cogniauxia Baill.

Baillon: 423 (1884); Keay: 208 (1954); Keraudren: 94 (1967); Fernandes & Fernandes: 274 (1970).

Dioecious herbaceous climbers; branches often puberulous; tendrils 2-furcate. **Leaves**: petiole not glandular; blade broadly ovate-cordate, with a wide sinus, acutely acuminate, entire or slightly lobulate-toothed, thinly coriaceous, very conspicuously and closely reticulate beneath with prominent looped nerves. **Male flowers** fairly large, in several- to many-flowered racemes, on long axillary peduncles; bracts linear; receptacle somewhat inflated basally and narrowed towards apex; sepals 5, short, triangular with subulate points, puberulous; petals 5, free, asymmetrically obovate, mucronate, entire, nervose, finely puberulous; stamens 3(5), two of them 2-thecous, one 1-thecous, thecae conduplicate, arising at bottom of receptacle; pistillode absent. **Female flowers** solitary; perianth similar to that of male flowers; ovary narrowly oblong, with 3 placentas; ovules many, horizontal. **Fruit** ovoid, fleshy, smooth. **Seeds** many, flattened, smooth, slightly oblique.

Species 2, trop. Africa; sthn trop. Afr. 1: *Cogniauxia podolaena* Baill., Angola.

Corallocarpus Welw. ex Hook.f.

Fernandes & Fernandes: 240 (1970); Jeffrey: 487 (1978); Jeffrey & Fernandes: 102 (1986).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ctenolepis Hook.f.

Jeffrey: 92 (1967); Keraudren: 48 (1967); Jeffrey: 460 (1978); Jeffrey & Fernandes: 68 (1986).

Sthn trop. Afr. 1: *Ctenolepis cerasiformis* (Stocks) Hook.f., ?Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cucumella Chiov.

Fernandes & Fernandes: 250 (1970); Jeffrey: 472 (1978); Jeffrey & Fernandes: 83 (1986); Kirkbride: 161 (1994).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cucumeropsis Naudin

Naudin: 30 (1866); Hooker: 533 (1871); Keay: 214 (1954); Jeffrey: 117 (1967); Keraudren: 60 (1967); Fernandes & Fernandes: 238 (1970).

Monoecious herbaceous climbers with robust, branched, angular, sparsely crisped-hairy stems; branches terete; tendrils simple. **Leaves** ± entire or 3–5-angled to -palmatilobed, finely toothed, deeply cordate at base, large, petiolate. **Male flowers** in racemes or in panicles and subumbellate at apex of a long common peduncle; petioles ± as long as flowers; receptacle tube campanulate, hairy inside above, lobes 5, lanceolate, reflexed; petals 5, united at base; stamens 3: 2 double, 2-thecous, 1 single, 1-thecous, sessile in upper part of receptacle, anthers subpeltate, thecae straight, apically hooked; pistillode of 3 short filaments or absent; disc cup-shaped, not distinct from base of receptacle tube. **Female flowers** solitary, on a hairy stalk; perianth similar to male; receptacle tube shortly cylindric, hairy inside above; ovary fusiform-cylindric, style short, stigmas 3, bilobed; ovaries many, horizontal; staminodes 3, very small or absent. **Fruit** rather large, cylindric-ellipsoid, rounded apically, rather firm-walled, fleshy, smooth, indehiscent, cream with green streaks. **Seeds** rather large, ovate in outline, compressed, smooth, pure white.

Monotypic genus: *Cucumeropsis mannii* Naud., tropical W Africa; sthn trop. Afr.: Angola.

Cucumis L.

Fernandes & Fernandes: 252 (1970); Jeffrey: 462 (1978); Halliday *et al.*: 70 (1986); Van Raamsdonk & Visser: 327 (1991); Kirkbride: 1 (1993); Bingham & Smith: 141 (2002).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cyclantheropsis Harms

Fernandes & Fernandes: 238 (1970); Jeffrey: 497 (1978); Jeffrey & Fernandes: 113 (1986); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. 1: *Cyclantheropsis parviflora* (Cogn.) Harms, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dactyliandra (Hook.f.) Hook.f.

Norman: 193 (1929); Fernandes & Fernandes: 249 (1970).

Sthn trop. Afr. 1: *Dactyliandra welwitschii* Hook.f., Angola, and sthn Afr.

Diplocyclos (Endl.) Post & Kuntze

Post & Kuntze: 178 (1903); Fernandes & Fernandes: 279 (1970) as *Diplocyclus*; Jeffrey: 451 (1978); Jeffrey & Fernandes: 59 (1986).

Bryonia L. sect. *Diplocyclos* Endl. *Bryonopsis* in sense of Hook.f.: 556 (1871) and in sense of many authors, not of Arn.

Monoecious, glabrous, scandent perennial herbs; young stems green-spotted. **Leaves** simple, palmately lobed, petiolate. **Tendrils** proximally 2-fid. **Probracts** present, small. **Flowers** unisexual, in sessile or shortly racemose few- to many-flowered axillary clusters, male and female often co-axillary. **Male flowers** on slender pedicels; receptacle tube short and broad; lobes small, remote; corolla whitish or pale yellow, gamopetalous, 5-lobed, lobes entire; stamens 3, two 2-thecous, one 1-thecous,

free; filaments arising on receptacle tube; connectives broad; thecae flexuous; disc ± undulate, adnate to receptacle tube. **Female flowers** subsessile; ovary terete; ovules rather few, horizontal; receptacle tube smaller and narrower than in male flowers, perianth otherwise similar; stigma 3-lobed. **Fruits** solitary or clustered, subsessile, baccate, fleshy, globose to ellipsoid, indehiscent, red with white longitudinal stripes or lines of markings. **Seeds** rather small, pyriform, with highly convex faces and thick 2-grooved, rugulose margins.

Species 4, trop. Africa with 1 extending to tropical Asia; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique; 1 species naturalised in sthn Afr.

Eureiandra Hook.f.

Hooker: 825 (1867); Norman: 196 (1929); Fernandes & Fernandes: 274 (1970); Jeffrey: 429 (1978); Jeffrey & Fernandes: 28 (1986).

Dioecious, scandent, softly ligneous shrubs or herbs; rootstock perennial, tuberous. **Leaves** simple, mostly palmately 3–5-lobed, entire to dentate, petiolate. **Tendrils** simple. **Flowers** unisexual. **Male flowers** solitary or few to many in sessile or pedunculate axillary fascicles; receptacle tube short, obconic below, expanded above, lobes lanceolate, entire; petals 5, free, entire, yellow or white; stamens 5: 4 in 2 pairs, 1 single, all 1-thecous, or paired stamens variously to completely united into 2 double 2-thecous stamens, free; filaments arising in mouth of lower part of receptacle tube; connectives broad; thecae flexuous. **Female flowers** solitary; perianth similar to that of male flower; receptacle smaller; staminodes 3 or 5, variously developed; ovary ellipsoid, rostrate, terete; ovules many, horizontal; stigma 3-lobed. **Fruit** ellipsoid, rostrate, fleshy, orange-red, indehiscent. **Seeds** tumid, margined; testa smooth or fibrillose.

Species 10, trop. Africa to Socotra; sthn trop. Afr 5(6), Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Gerrardanthus Harv. ex Hook.f.

Fernandes & Fernandes: 237 (1970); Jeffrey: 495 (1978); Jeffrey & Fernandes: 110 (1986); White *et al.*: 217 (2001).

Sthn trop. Afr. 3, Angola, Malawi, Mozambique, and sthn Afr.

Kedrostis Medik.

Fernandes & Fernandes: 239 (1970); Jeffrey: 484 (1978); Jeffrey & Fernandes: 97 (1986).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lagenaria Ser.

Fernandes & Fernandes: 271 (1970); Jeffrey: 437 (1978); Jeffrey & Fernandes: 38 (1986); White *et al.*: 218 (2001).

Adenopus Benth.; Norman: 196 (1929).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Luffa Mill.

Miller: [806] (1754); Fernandes & Fernandes: 270 (1970); Jeffrey: 454 (1978); Jeffrey & Fernandes: 61 (1986).

Monoecious, annual, prostrate or scandent herbs. **Leaves** simple, palmately 5–7-lobed, petiolate, asperulose or scabrid, petiolate. **Tendrils** proximally 2–6-fid. **Flowers** unisexual. **Male flowers** racemose; receptacle tube broadly campanulate, lobes large, enclosing petals in bud, entire; petals 5, free, entire, yellow or whitish; stamens 5, all 1-thecous, or three 1-thecous, or two 2-thecous and one 1-thecous; filaments arising on receptacle tube, free; anthers free; connectives broad; thecae much convoluted. **Female flowers** solitary; ovary smooth, ribbed, tuberculate or spiny; ovules many, horizontal; stigma 3-lobed. **Fruit** globose to cylindric, rostrate, smooth, ribbed or spiny, dry, brownish, fibrous, dehiscent by an apical operculum. **Seeds** compressed, oblong-elliptic in outline.

Species 7, tropical, 4 in Old World; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique; frequently cultivated.

Momordica L.

Fernandes & Fernandes: 260 (1970); Jeffrey: 419 (1978); Jeffrey *et al.*: 11 (1986); White *et al.*: 218 (2001).

Dimorphochlamys Hook.f.; Norman: 195 (1929). *Raphanocarpus* Hook.f.; Fernandes & Fernandes: 269 (1970), as to *R. welwitschii* Hook.f.

Sthn trop. Afr. 21, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mukia Arn.

Fernandes & Fernandes: 248 (1970); Jeffrey: 475 (1978); Jeffrey & Fernandes: 85 (1986).

Sthn trop. Afr. 1: *Mukia maderaspatana* (L.) M.Roem., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Oreosyce Hook.f.

Fernandes & Fernandes: 252 (1970); Jeffrey: 470 (1978); Jeffrey & Fernandes: 81 (1986).

Probably monotypic: *Oreosyce africana* Hook.f.; sthn trop. Afr., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Peponium Engl.

Fernandes & Fernandes: 282 (1970); Jeffrey: 492 (1978); Jeffrey & Fernandes: 106 (1986); White *et al.*: 218 (2001); Mapaura & Timberlake: 163 (2002).

Sthn trop. Afr. 5, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Raphidiocystis Hook.f.

Hooker: 828 (1867); Keraudren & Jeffrey: 319 (1967); Fernandes & Fernandes: 281 (1970); Jeffrey: 440 (1978).

Monoecious, scandent, ± pilose herbs; stems up to 6 m long. **Leaves** simple, ovate in outline, unlobed to shortly palmately 3–5-lobed, petiolate. **Tendrils** simple. **Probracts** present. **Flowers** unisexual. **Male flowers** in sessile axillary fascicles, bracteate; receptacle tube short, obconic-campanulate, lobes lanceolate to broadly foliaceous, often pinnately divided into narrow or ± expanded often deflexed lobes; corolla gamopetalous, 5-lobed, lobes entire, yellow; stamens 3, all 2-thecous; filaments arising on upper part of receptacle tube, thecae flexuous. **Female flowers** fewer than males and

coaxillary with them; perianth similar to that of male flower, receptacle lobes usually smaller and less divided; ovary densely setose; ovules many, horizontal; stigma 3-lobed. **Fruit** subglobose to ellipsoid-cylindric, fleshy, densely echinate with multicellular brownish setae, dehiscent by 10 apical valves and extruding seeds and placentae. **Seeds** asymmetrically broadly ovate in outline, compressed; testa smooth, bordered.

Species 5, trop. Africa and Madagascar; sthn trop Afr. 2, Angola, Zimbabwe.

*Sicyos L.

Linnaeus: 1013 (1753); Jeffrey: 78 (1967); Keraudren: 12 (1967); Fernandes & Fernandes: 288 (1970).

Monoecious, annual, climbing or trailing herbs; stems usually ± hairy; tendrils 3–5-fid. **Leaves** simple, palmately 5-lobed, broadly ovate- or reniform-cordate in outline. **Male flowers** small, few to many in simple or branched racemes, often whorled or ± capitate; receptacle tube shallowly campanulate, lobes 5, small, dentiform; petals 5, united at very base, entire; stamens 3, filaments arising at base of tube, united into a central column, anthers united into a head or sometimes ± free, thecae arcuate, flexuose or triplicate. **Female flowers** 3–20 subsessile in capitate, pedunculate groups, smaller than and coaxillary with male flowers; receptacle tube campanulate, lobes 5, triangular-subulate; petals 5, ± triangular; ovary 1-locular, ovoid and beaked, beset with forward-curving, subappressed bristles; ovule solitary, pendulous. **Fruit** rather small, dry and coriaceous or woody, 1-seeded, eventually splitting, ovoid and beaked or fusiform, ± hairy and usually beset with bristles or spines, each arising on a small basal tubercle, 3–20 borne in subsessile clusters on a short to fairly long peduncle. **Seed** broadly ovate-oblong in outline, compressed, with slight apical thickenings; testa smooth, brown.

Species 50, tropical America, Australia, New Zealand; sthn trop. Afr. 1: **Sicyos polyacanthus* Cogn., naturalised in Angola.

Telfairia Hook.

Hooker: t. 2751 & 2752 (1827); Fernandes & Fernandes: 260 (1970); Jeffrey: 417 (1978); Jeffrey & Fernandes: 8 (1986); Phiri (Unpublished).

Dioecious lianes, up to 30 m or longer. **Leaves** pedately 3–7-foliolate. **Tendrils** proximally bifid. **Probracts** present. **Flowers** unisexual, large, purplish. **Male flowers** many, racemose; receptacle tube short, broad; lobes dentate; petals 5, free, fringed with filaments; stamens 5 or 3, if 5, then all 2-thecous, if 3, then two 4-thecous, one 2-thecous, free; filaments arising on receptacle tube; thecae straight or slightly arcuate. **Female flowers** solitary; perianth similar to that of male flower; ovary ribbed; ovules many, horizontal; stigma 3-lobed. **Fruit** very large, fleshy, ribbed, many-seeded, tardily dehiscent by 10 longitudinal valves. **Seeds** large, broadly ovate or suborbicular in outline, compressed, enclosed in a fibrous endocarpic sheath.

Species 3, Africa; sthn trop. Afr. 2, Angola, Zambia and probably native in N Mozambique, often cultivated for its edible oily seeds.

Trochomeria Hook.f.

Fernandes & Fernandes: 284 (1970); Jeffrey: 456 (1978); Jeffrey & Fernandes: 64 (1986).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Zehneria Endl.

Fernandes & Fernandes: 242 (1970); Jeffrey: 477 (1978); Jeffrey & Fernandes: 87 (1986); White *et al.*: 220 (2001); Mapaura & Timberlake: 164 (2002).

Melothria L.; Norman: 193 (1929).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Dichapetalaceae
(Chailletiaceae)
(Rosidae—Malpighiales)
(Eurosids I—Malpighiales)

Archer, R.H. in Leistner: 242 (2000).

Sthn trop. Afr.: genera 2, species ± 41.

Dichapetalum Thouars

Exell & Mendonça: 320 (1951) under Chailletiaceae; Exell & Mendonça: xvi, xviii (1954/1956); Torre: 319 (1963); Breteler: 10 (1986); Breteler: 4 (2001); White *et al.*: 220 (2001); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 164 (2002).

Chailletia DC.; Hiern: 136 (1896) as synonym.

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tapura Aubl.

Torre: 328 (1963); Breteler: 43 (1986); Breteler: 122 (2001); White *et al.*: 222 (2001); Coates Palgrave: 460 (2002); Phiri (Unpublished).

Sthn trop. Afr. 1: *Tapura fischeri* Engl., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Dilleniaceae
(Dilleniidae—Dilleniales)
(Core Eudicots)

Shrubs or climbers, sometimes small trees, rarely perennial herbs. **Leaves** alternate, simple, entire or variously toothed, often scabrous, with prominent parallel lateral veins; stipules absent or represented by a narrow wing adnate to petiole. **Flowers** bisexual, regular, often relatively large and showy, in terminal or axillary cymes, racemes or panicles or solitary. **Sepals** 5, free, imbricate, persistent. **Petals** 5 or fewer, free, imbricate, often crumpled in bud, caducous. **Stamens** many, free or partially united at base into bundles, often persistent; anthers 2-thecous, opening by longitudinal slits or apical pores. **Ovary** of (1–)3–5(–20) ± free carpels; ovules 1 or more per carpel, anatropous, bitegmic, erect, from base on inner suture; styles free; stigma simple. **Fruit**: ripe carpels dehiscent or berry-like. **Seeds** with a crested or laciniate funicular aril; embryo minute; endosperm copious, fleshy.

Genera 12, species 300, tropical and warm regions, especially Australia, in Africa only members of the pantropical genus *Tetracera*; sthn trop. Afr.: genus 1, species 6.

Salisbury: t. 73 (1807); Exell & Mendonça: 354, 379 (1937/1951); Wild: 103 (1960); Lucas: 1 (1968); Mabberley: 229 (1997).

Tetracera L.

Linnaeus: 533 (1753); Exell & Mendonça: 7 (1937/1951); Wild: 103 (1960); Lucas: 1 (1968); Kubitzki: 1 (1970); Wild & Gonçalves: 1 (1973).

Description as for family.

Species 40, tropical; sthn trop. Afr. 6, Angola, Zambia, Mozambique.

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Dipsacaceae
(Asteridae—Dipsacales)
(Euasterids II—Dipsacales)

Welman, W.G. in Leistner: 243 (2000).

Sthn trop. Afr.: genera 3, species 7.

Key to genera
[after Cannon & Cannon (1983)]

1a Calyx without persistent bristles ..... **Cephalaria**
1b Calyx with persistent bristles:
2a Calyx bristles plumose ..... **Pterocephalus**
2b Calyx bristles not plumose ..... **Scabiosa**

Cephalaria Schrad. ex Roem. & Schult.
Napper: 463 (1968a); Napper: 4 (1968b); Cannon & Cannon: 78 (1983).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pterocephalus Adans.
Adanson: 152 (1763); Napper: 9 (1968b); Cannon & Cannon: 81 (1983); Izidine & Bandeira: 50 (2002) under Crassulaceae.

Woody subshrubs with erect leafy shoots bearing several capitula; stems hollow, branched, pubescent, in lower parts mixed with long, glandular-based hairs. **Leaves** opposite, connate, linear-lanceolate or lanceolate, toothed, with 1 or 2 pairs of linear-lanceolate or linear leaflets at base. **Flowers** aggregated into hemispherical or globular heads, with 1 or 2 rows of foliaceous receptacular bracts; receptacle scales hairy or 0; involucel ± sulcate, 8-furrowed, toothed or with a ± membranous corona. **Calyx** short, with 5–24 plumose setae of equal length. **Corolla** usually 5-fid or with 4–6-fid flowers in same head, rarely entirely 4-fid. **Stamens** 4. **Ovary**: stigma oblique, entire or slightly 2-lobed. **Fruit**: mature fruit unknown.

Species ± 25, found mainly in the Middle East, spreading to southern Europe, India, China and Thailand, a few species occurring in the Canary Isles and North and East Africa; sthn trop. Afr. 1: *Pterocephalus centennii* M.J.Cannon, Mozambique.

Scabiosa L.
Napper: 7 (1968b); Cannon & Cannon: 81 (1983).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Dipterocarpaceae
(Dilleniidae—Malvales)
(Eurosids II—Malvales)

Trees, often buttressed, or shrubs. **Leaves** alternate, simple, entire to sinuate at margin, petiolate, with an extrafloral nectary at base of midrib on upper surface, midrib and lateral nerves ± depressed above, prominent beneath with tertiary venation densely reticulate; indumentum of simple fasciculate or stellate hairs, minute spherical glands often present. **Flowers** bisexual, regular, in axillary or branched terminal inflorescences; bracts and bracteoles paired, soon falling; receptacle produced into a very short, thick androgynophore (*Marquesia*) or hardly produced. **Sepals** 5, free or slightly fused at base, hairy, accrescent. **Petals** 5, free or slightly connate at base, contorted to right, hairy or glabrescent. **Stamens** many; filaments free to slightly connate at base; anthers 2-thecous, basi-versile, with apical appendage of connective scarcely to somewhat developed, introrse or laterally dehiscent by longitudinal slits. **Ovary** superior, 3–5-locular, sometimes 1-locular at apex (*Marquesia*); ovules 2 per locule, anatropous, parietal or axile. **Fruit** nut-like, 1-seeded, with very hard woody pericarp, surrounded by 5 wing-like, accrescent, prominently veined sepals. **Seeds** with thin brown testa, a thin mucilaginous layer representing rest of endosperm and a large embryo with 2 large, irregularly crumpled and rolled cotyledons.

Genera 16, species 680, tropical Old World, especially Malesian rainforests; sthn trop. Afr. genera 2, species ± 27. Both local genera are placed in subfamily Monotoideae.

Blume: 222 (1825) name conserved; Gilg: 2377 (1925); Bancroft: 387 (1937/1951); Duvigneaud: 407 (1961); Verdcourt: 1 (1989); Mabberley: 234 (1997).

Key to genera

Tall trees with straight, buttressed trunks; branchlets densely longitudinally channelled; leaves acuminate; stamens and ovary borne on a short thick androgynophore; anthers not appendiculate at the apex; ovary 3-locular at base, 1-locular at apex. ..... **Marquesia**

Trees or shrubs with irregular, unbuttressed trunks; branchlets ± smooth; leaves only rarely acuminate, often rounded or retuse; stamens and ovary borne on the scarcely produced receptacle; anthers frequently with triangular or ovate apical appendage; ovary completely 3–5-locular .... **Monotes**

Marquesia Gilg

Gilg: 485 (1908); Gilg: 268 (1925); Exell: 220 (1932); Bancroft: 142, 372 (1937/1951); Duvigneaud: 407 (1961); White: 258 (1962); Verdcourt: 2 (1989).

Tall or medium-sized, buttressed trees. **Leaves** evergreen, acuminate; midrib and lateral nerves prominent beneath with tertiary venation densely reticulate; indumentum of simple, isolated, short, thick-walled hairs and with minute spherical glands on venation. **Flowers** small, in terminal and axillary panicles; sepals velvety pubescent; petals ± glabrous. **Receptacle** produced into a thick, short androgynophore. **Stamens** many; anthers short, connectives without appendage. **Ovary** ovoid, pubescent, 1-locular above, with parietal placentation; ovules 6. **Fruit** ovoid, surrounded by 5 equal wings derived from accrescent sepals.

Species 3 or 4, trop. Africa; sthn trop. Afr. 2, Angola, Zambia.

Monotes A.DC.

Candolle: 623 (1868); Gilg: 268 (1925); Bancroft: 132, 370 (1937/1951); Bancroft: 326 (1939); Duvigneaud: 410 (1961); White: 258 (1962); Verdcourt: 4 (1989); Coates Palgrave: 738 (2002).

Vatica L.; Burtt Davy *et al.*: 45 (1958).

Shrubs to medium-sized trees without buttresses. **Leaves** mostly rounded or retuse at apex, only rarely acuminate with ± rounded extrafloral nectary at base of midrib above, and sometimes additional ones in lower nerve axils; midrib and lateral nerves ± impressed above, prominent beneath, venation almost always very densely reticulate beneath; indumentum very varied: hairs simple, fasciculate or stellate, short or rather long, straight, curved or coiled, with small, spherical glands sparse to dense on both surfaces, making blade viscid. **Flowers** in axillary, small or compound panicles. **Sepals** and **petals** densely silky-pilose or velvety outside, pilose at base inside. **Receptacle** slightly produced into a very short thick androgynophore. **Stamens** many; anthers short, connectives often produced into short, triangular or ovate appendages at apex. **Ovary** ovoid, hairy, completely 3–5-locular, with 2 ovules in each locule. **Fruit** subglobose, woody, surrounded by 5 subequal, minutely hairy wings derived from accrescent sepals.

Species ± 30, trop. Africa and Madagascar; sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique. Note: *Monotes glaber* Sprague occurs in Botswana (Duvigneaud: 415 (1961), but is not given in Leistner (2000) nor in Germishuizen & Meyer (2003).

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Droseraceae

(Dilleniidae—Nepenthales)
(Core Eudicots—Caryophyllales)

Dreyer, L.L. & Jordaan, M. in Leistner: 244 (2000).

Sthn trop. Afr.: genera 2, species 11.

Aldrovanda L.

Laundon: 24 (1970); Laundon: 62 (1978); Laundon & Pinto Basto: 6 (1993).

Sthn trop. Afr. 1: *Aldrovanda vesiculosa* L., Zambia, ?Mozambique, and sthn Afr.

Drosera L.

Laundon: 24 (1970); Laundon: 64 (1978); Laundon & Pinto Basto: 6 (1993); Lebrun & Stork: 224 (2003); Rivadiva *et al.*: 123 (2003).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Ebenaceae
(Dilleniidae—Theales)
(Asterids—Ericales)

Bredenkamp, C.L. in Leistner: 245 (2000).

Sthn trop. Afr.: genera 2, species 52.

Diospyros L.

White: 245 (1978); White: 251 (1983); White: 325 (1988); White & Verdcourt: 2 (1996); White: 95 (1998); Wallnöfer: 501 (2001); White *et al.*: 222 (2001); Coates Palgrave: 895 (2002); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 164 (2002).

Royena L.; Burtt Davy *et al.*: 46 (1958).

Sthn trop. Afr. 45, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Euclea Murray

Gürke: 138 (1902); White: 333 (1962); White: 288 (1983); White & Verdcourt: 43 (1996); White: 95 (1998); Wallnöfer: 503 (2001); White *et al.*: 227 (2001); Coates Palgrave: 885 (2002).

Maba J.R.Forst. & G.Forst.; Greves: 75 (1929); Burtt Davy *et al.*: 46 (1958).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Elatinaceae
(Dilleniidae—Guttiferales)
(Eurosids I—Malpighiales)

Bredenkamp, C.L. in Leistner: 246 (2000).

Sthn trop. Afr.: genera 2, species ± 9.

Bergia L.

Exell & Mendonça: 118 (1937/1951); Wild: 373 (1961); Wild & Diniz: 1 (1973); Lebrun & Stork: 236 (2003).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Elatine L.

Wild: 377 (1961).

Sthn trop. Afr. ?2, Zimbabwe, and sthn Afr.

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Ericaceae
(Dilleniidae—Ericales)
(Asterids—Ericales)

Oliver, E.G.H. in Leistner: 246 (2000).

Sthn trop. Afr.: genera 3, species 21.

Key to genera

1a Leaves not wider than 5 mm, ericoid or cupressoid ..... **Erica**
1b Leaves wider than 10 mm, flat:
2a Ovary superior; fruit a capsule ..... **Agarista**
2b Overy inferior; fruit a berry ..... **Vaccinium**

Agarista D.Don ex G.Don

Don:788, 837 (1834); Judd: 274 (1984); White *et al.*: 230 (2001).

Agauria (DC.) Hook.f.; Sleumer: 374 (1938); White: 315 (1962); Ross: 158 (1983).

Small trees; branchlets glabrous or pubescent. **Leaves** subopposite to alternate, subsessile to petiolate, evergreen, lanceolate to oblong to ovate or obovate. **Inflorescence** consisting of axillary and terminal racemes; pedicels short, l-flowered, subtended by caducous bracts, each bearing a pair of caducous bracteoles. **Calyx** hypogynous; segments 5, fused below, persistent in fruit. **Corolla** hypogynous, obconical; lobes 5, small, imbricate, not persistent in fruit. **Stamens** 10, included, adhering slightly to corolla at base and shed with it; filaments geniculate; anthers dehiscing by terminal pores. **Ovary** superior, 5-celled; ovules few, placentation basal; style 1, persistent until capsule dehisces. **Capsule** 5-valved, loculicidal, without a central column after dehiscence.

Species 30: 29 in the Americas, 1 on high ground throughout trop. Africa, and in Madagascar and the Mascarene islands: *Agarista salicifolia* (Comm. ex Lam.) G.Don; sthn trop. Afr.: Angola, Zambia, Malawi, Mozambique.

Erica L.

Ross: 163 (1983); Oliver: 665 (1992); Oliver: 771 (1994); Oliver: 1 (2000); White *et al.*: 232 (2001); Coates Palgrave: 860 (2002); Izidine & Bandeira: 50 (2002); Msekandiana & Mlangeni: 35 (2002); Strugnell: 16 (2002).

Blaeria L.; Ross: 170 (1983). *Ericinella* Klotzsch; Ross: 173 (1983). *Philippia* Klotzsch; Burtt Davy *et al.*: 48 (1958); White: 315 (1962); Ross: 174 (1983).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Vaccinium L.

Burtt Davy *et al.*: 100 (1958); Ross: 160 (1983); White *et al.*: 236 (2001); Coates Palgrave: 860 (2002).

Sthn trop. Afr. 2, Malawi, Mozambique, and sthn Afr.

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Erythroxylaceae
(including Nectaropetalaceae)
(Rosidae—Linales)
(Eurosids I—Malpighiales)

Bredenkamp, C.L. in Leistner: 248 (2000).

Sthn trop. Afr.: genera 4, species 9.

Key to genera

1a Leaves opposite; stipules extrapetiolar; fruit a narrowly pear-shaped capsule, usually with 1 seed in each of 3 fertile locules ..... **Aneulophus**
1b Leaves alternate; stipules intra- or extrapetiolar; fruit fleshy, perhaps a capsule in *Pinacopodium*:
2a Styles 3, rarely 2, free or partially united; ovary 3(2)-locular ..... **Erythroxylum**
2b Styles 2, completely united, sometimes very short; stigmas 2 or 1 and then 2-lobed:
3a Stipules intrapetiolar; style well-developed with 2 free, spreading to reflexed stigmas; fruit a drupe ..... **Nectaropetalum**
3b Stipules extrapetiolar; style very short with the 2-lobed stigma almost sessile; fruit probably a capsule ..... **Pinacopodium**

Aneulophus Benth.

Bentham: 244 (1862); Wilczek: 39 (1958) under Linaceae; Mendes: 9 (1961); Badré: 53 (1973).

Shrubs or small trees, glabrous. **Leaves** opposite, petiolate, simple, entire, penninerved; stipules 2, extrapetiolar, opposite, simple, ± caducous. **Inflorescences** many-flowered axillary fascicles; bracts ciliolate, persistent. **Flowers** small, white; pedicels glabrous. **Sepals** 5, imbricate, slightly fused at base, glabrous. **Petals** 5, imbricate, longer than sepals, oblanceolate, ± caducous. **Stamens** 10, all fertile, subequal; filaments fused at base into a short ring. **Ovary** 3(4)-locular, 3-lobed at apex, sessile; ovules 2 per locule; styles 3(4), free or fused up to halfway; stigmas 3, terminal, capitate. **Fruit** a narrowly pear-shaped capsule, usually with 3 fertile locules. **Seeds** 1 per locule, oblong, with a yellowish apical arillus; embryo straight.

Monotypic trop. African genus: *Aneulophus africanus* Benth.; sthn trop. Afr., Angola.

Erythroxylum P.Browne

Exell & Mendonça: 248 (1937/1951b); Robson: 103 (1963); Robson & Gonçalves: 2 (1969); Verdcourt: 1 (1984); White *et al.*: 236 (2001); Coates Palgrave: 403 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Nectaropetalum Engl.

Robson: 108 (1963); Robson & Gonçalves: 9 (1969); Verdcourt: 7 (1984); Izidine & Bandeira: 57 (2002).

Sthn trop. Afr. 1: *Nectaropetalum carvalhoi* Engl., Mozambique, and sthn Afr.

Pinacopodium Exell & Mendonça

Exell & Mendonça: 105 (1951); Exell & Mendonça: 246 (1937/1951a) under Nectaropetalaceae; Normand & Cavaco: 451 (1951); Badré: 19 (1973).

Nectaropetalum Engl. in part; Exell: 50 (1927).

Tall, glabrous trees. **Leaves** alternate, simple, entire, petiolate; stipules interpetiolar, soon caducous. **Flowers** in subumbellate, pedunculate cymes. **Calyx** campanulate, with 5 valvate sepals. **Petals** (4)5, free, concave, unguiculate, with indistinct nectariferous areas near base on ventral face. **Stamens** 10–12(?15), all fertile; filaments fused at base into a very short tube; anthers basifixed, apiculate, dehiscing longitudinally. **Ovary** 2-locular, with 1 pendent, axile ovule per locule; style very short; stigma capitate, 2-lobed. **Fruit** probably a capsule.

Species 2, trop. Africa; sthn trop. Afr. 1: *Pinacopodium congolense* (S.Moore) Exell & Mendonça, Angola.

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Escalloniaceae

(Rosidae—Rosales)
(Euasterids II)

Jordaan, M. in Leistner: 249 (2000).

Sthn trop. Afr.: genus 1, species 1.

Choristylis Harv.

Verdcourt: 1 (1973); Verdcourt: 1 (1983); White *et al.*: 238 (2001); Coates Palgrave: 241 (2002).

Monotypic: *Choristylis rhannoides* Harv.; sthn trop. Afr.: Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Euphorbiaceae

(Dilleniidae—Malpighiales)
(Eurosids I—Malpighiales)

Archer, R.H. in Leistner: 249 (2000).

Sthn trop. Afr.: genera 75, species 538.

Main sources of information: Webster (1994); Radcliffe-Smith (1996); Archer (2000); Carter & Leach (2001); Esser (2001); Radcliffe-Smith (2001); Carter (2002); Angiosperm Phylogeny Group (2003).

Key to subfamilies

1a Locules of ovary each with 2 ovules; milky latex and stinging hairs absent; indumentum simple:
2a Leaves alternate, simple, not lobed; stipules present; pollen grains not conspicuously spiny (irregularly spiny in *Amanoa*); seeds without caruncle ... **Phyllanthoideae**
2b Leaves opposite, alternate or verticillate, compound; pollen grains spiny ... **Oldfieldioideae**
1b Locules of ovary each with one ovule; milky latex present or absent; indumentum various:
3a Latex absent ... **Acalyphoideae**
3b Latex present:
4a Latex reddish, yellowish or milky; indumentum often stellate or lepidote ... **Crotonoideae**
4b Latex whitish, often caustic or toxic; indumentum simple or absent ... **Euphorbioideae**

Subfamily **Phyllanthoideae**

Key to tribes of subfamily Phyllanthoideae

1a Sepals valvate ... Tribe **Bridelieae** (*Bridelia*, *Cleistanthus*)
1b Sepals imbricate or open:
2a Flowers fasciculate:
3a Male disc intrastaminal ... Tribe **Drypeteae** (*Drypetes*)
3b Male disc extrastaminal or absent:
4a Petals present:
5a Stipules deciduous; pollen exine finely reticulate, not coarsely reticulate or spinose ... Tribe **Wielandieae** (*Heywoodia*)
5b Stipules persistent; pollen exine coarsely and deeply reticulate; baculate or echinate ... Tribe **Amanoeae** (*Amanoa*)
4b Petals absent (except in *Andrachne*) ... Tribe **Phyllantheae** (*Andrachne*, **Breynia*, *Flueggea*, *Margaritaria*, *Meineckia*, *Phyllanthus*, *Pseudolachnostylis*)
2b Flowers capitate, spicate or racemose:
6a Fruits not winged ... Tribe **Antidesmeae** (*Antidesma*, *Maesobotrya*, *Spondianthus*, *Thecacoris*, *Uapaca*)
6b Fruits winged ... Tribe **Hymenocardieae** (*Hymenocardia*)

Subfamily **Oldfieldioideae**

Represented in the area only by the tribe **Picrodendreae** (*Androstachys*, *Aristogeitonia*, *Oldfieldia*)

Subfamily **Acalyphoideae**

Key to tribes of subfamily Acalyphoideae

1a Petals present, at least in the male flowers:
2a Flowers fasciculate; seeds black, shiny:
3a Mostly herbaceous perennials; fruits dehiscent ... Tribe **Clutieae** (*Clutia*)
3b Trees or shrubs; fruits drupaceous ... Tribe **Galearieae** (see Pandaceae: *Microdesmis*, *Panda*)
2b Flowers spicate, racemose or subpaniculate; seeds not as above:
4a Trees or shrubs ... Tribe **Agrostistachydeae** (*Cyttaranthus*, *Pseudagrostistachys*)
4b Herbs ... Tribe **Chrozophoreae** (*Caperonia*, *Chrozophora*)
1b Petals absent:
5a Plants often scandent or twining; styles unlobed, mostly connate ... Tribe **Plukenetieae** (*Dalechampia*, *Plukenetia*, *Tragia*, *Tragiella*)

5b Plants rarely scandent; styles mostly free or basally connate:
6a Male disc present:
7a Laminar glands present:
8a Male disc tenuous or absent; stamens (2)20–60(90); anther connective usually not enlarged ..... Tribe **Bernardieae** (*Necepsia*, *Paranecepsia*)
8b Male disc massive, pubescent; stamens 4–15; anther connective enlarged ..... Tribe **Caryodendreae** (*Discoglypremna*)
7b Laminar glands absent:
9a Stamens 50 or more, free; pistillode absent ..... Tribe **Pycnocomeae** (*Argomuellera*, *Pycnocoma*)
9b Stamens 5–20, connate at the base into a column; pistillode present ..... Tribe **Chaetocarpeae** (*Chaetocarpus*)
6b Male disc absent, or if present then anther cells free but not becoming flexuous-vermiform:
10a Male flowers usually capitate; pollen coarsely reticulate ..... Tribe **Epiprineae** (*Cephalocroton*)
10b Male inflorescences various; pollen finely perforate-tectate to rugulose:
11a Pollen colpi operculate ..... Tribe **Alchorneae** (*Alchornea*)
11b Pollen colpi inoperculate, often reduced ..... Tribe **Acalypheae** (*Acalypha*, *Erythrococca*, *Leidesia*, *Macaranga*, *Mallotus*, *Micrococca*, **Ricinus*)

Subfamily **Crotonoideae**

Key to tribes of subfamily Crotonoideae

1a Indumentum simple or none; petals absent:
2a Plants monoecious; lacticifers jointed:
3a Pollen colporate; endosperm oily ..... Tribe **Micrandreae** (*Hevea*; not dealt with in text)
3b Pollen periporate; endosperm starchy ..... Tribe **Manihoteae** (**Manihot*)
2b Plants mostly dioecious; laticifers not jointed:
4a Leaves not pellucid-punctate; inflorescences axillary or terminal ..... Tribe **Adenoclineae** (*Adenocline*, *Tetrorchidium*)
4b Leaves pellucid-punctate; inflorescences leaf-opposed ..... Tribe **Gelonieae** (*Suregada*)
1b Indumentum various; petals present, or if absent then indumentum stellate or lepidote:
5a Male sepals fused in bud, splitting valvately into 2–5 lobes ..... Tribe **Aleuritideae** (**Aleurites*, *Cavacoa*, *Crotonogyne*, *Manniophyton*, *Neoboutonia*, *Neoholstia*, *Tannodia*, **Vernicia*)
5b Male sepals usually imbricate, free, or if connate then not completely covering the petals in bud:
6a Indumentum simple:
7a Inflorescences terminal, dichasial ..... Tribe **Jatropheae** (*Jatropha*)
7b Inflorescences mostly axillary, spicate, racemose or paniculate ..... Tribe **Codiaeae** (**Codiaeum*)
6b Indumentum stellate or lepidote, at least in part:
8a Petals free; fruit usually dehiscent; seeds carunculate ..... Tribe **Crotoneae** (*Croton*, *Mildbraedia*)
8b Petals coherent; fruit indehiscent; seeds ecarunculate ..... Tribe **Ricinodendreae** (*Ricinodendron*, *Schinziophyton*)

Subfamily **Euphorbioideae**

Key to tribes of subfamily Euphorbioideae

Inflorescences racemose or spicate, but if capitate, then not resembling a single flower ..... Tribe **Hippomaneae** (*Excoecaria*, *Maprounea*, *Microstachys*, *Sclerocroton*, *Shirakiopsis*, *Spirostachys*)
Inflorescences cyathial, resembling a single flower ..... Tribe **Euphorbieae** (*Anthostema*, *Elaeophorbia*, *Endadenium*, *Euphorbia*, *Monadenium*, *Synadenium*)

Key to all genera in sthn trop. Afr.

1a Male and female flowers reduced and enclosed within a common cup-like involucre:
2a Male calyx present; involucre of 4 partially or completely fused bracts ..... **Anthostema**
2b Male calyx absent; involucral bracts usually 5, connate into a cup or tube:
3a Involucral glands (1, 2)4, 5(8), free, interbracteal, on the margin of cyathia:
4a Leaves opposite, inequilateral at base, veins surrounded by a chlorenchyma sheath; stipules present; main axis aborting above cotyledons; seeds usually ecarunculate ..... (=*Chamaesyce*) **Euphorbia**
4b Leaves alternate, opposite or whorled, if opposite then not inequilateral at base; stipules present or absent; main axis not aborting; seeds carunculate or ecarunculate:
5a Female perianth present; ovary not confluent with pedicel; fruit not or rarely slightly fleshy, dehiscent ..... **Euphorbia**
5b Female perianth absent; ovary confluent with pedicel; fruit thick, fleshy, indehiscent, drupaceous ..... **Elaeophorbia**
3b Involucral glands not as above; cyathophylls often united into a cup:
6a Cyathia somewhat bilaterally symmetrical; involucral glands connate into a ring open on one side ..... **Monadenium**
6b Cyathia radially symmetrical, without a gap on one side:
7a Involucral glands connate, conspicuous; ovary without angular crests ..... **Synadenium**
7b Involucral glands distinct, inconspicuous; ovary with prominent double angular crests ..... **Endadenium**
1b Male and female flowers differently arranged:
8a Leaves compound:
9a At least some leaves opposite, subopposite or whorled:

10a Stipules present; leaves 1-foliolate or digitately 2- or 3-foliolate ..... **Aristogeitonia**
10b Stipules absent; leaves digitately 3–8-foliolate ..... **Oldfieldia**
9b All leaves alternate:
11a Petals absent ..... **Hevea** (Pará rubber tree; not dealt with in text)
11b Petals present:
12a Petiolules absent; stipules persistent; endocarp smooth ..... **Ricinodendron**
12b Petiolules distinct; stipules fugacious; endocarp deeply pitted ..... **Schinziophyton**
8b Leaves simple although sometimes deeply lobed:
13a Leaves opposite:
14a Plant herbaceous ..... **Adenocline**
14b Shrubs or trees:
15a Stipules large, intrapetiolar, completely enclosing the terminal bud ..... **Androstachys**
15b Stipules small, parapetiolar:
16a Leaf apex acutely acuminate; stamens many ..... **Mallotus**
16b Leaf apex obtuse or emarginate, mucronulate; stamens few ..... **Excoecaria**
13b Leaves alternate:
17a Petals present, at least in the male flowers:
18a Indumentum stellate or lepidote:
19a Anthers inflexed in bud ..... **Croton**
19b Anthers erect in bud:
20a Fruit massive, indehiscent ..... ***Aleurites**
20b Fruits readily dehiscent:
21a Monoecious herb ..... **Chrozophora**
21b Dioecious shrubs or trees:
22a Male sepals 5(6), free to slightly connate at base, imbricate ..... **Mildbraedia**
22b Male sepals (2)3(4), closed in bud, valvate:
23a Leaves palminerved, 3- or 4-glandular at the base ..... **Manniophyton**
23b Leaves penninerved, 2-glandular at the base ..... **Crotonogyne**
18b Indumentum simple or absent:
24a Flowers in axillary fascicles:
25a Fruit generally indehiscent: a berry or a drupe:
26a Disc present; calyx segments valvate ..... **Bridelia**
26b Disc absent; calyx segments slightly imbricate ..... **Microdesmis** (see Pandaceae)
25b Fruit dehiscent:
27a Disc of male flowers cupular ..... **Heywoodia**
27b Disc of male flowers lobate or of separate glands:
28a Disc of male flowers lobate ..... **Amanoa**
28b Disc of male flowers of separate glands:
29a Disc glands in 1 or 2 series on the receptacle only ..... **Andrachne**
29b Disc glands in (1)2 or 3 series on sepals, petals and receptacle ..... **Clutia**
24b Flowers in spicate, racemose, paniculate or cymose inflorescences:
30a Male calyx lobes imbricate:
31a Inflorescences cymose ..... **Jatropha**
31b Inflorescences racemose:
32a Stamens 15–100; ovules 1 per locule ..... ***Codiaeum**
32b Stamens 5; ovules 2 per locule:
33a Styles connate, with 3 sessile, 2-fid stigmas; anthers basifixed ..... **Amanoa**
33b Styles free or connate at base, stigmas 2-fid; anthers medi- or apicifixed:
34a Anthers apicifixed; disc of male flowers pubescent ..... **Thecacoris**
34b Anthers medifixed; disc of male flowers glabrous ..... **Spondianthus**
30b Male calyx lobes valvate, or calyx ± truncate:
35a Fruit up to 50 mm in diameter, ± tardily dehiscent:
36a Stamens 15–20, in 3 or 4 whorls; pistillode 0 ..... ***Vernicia**
36b Stamens 10, in 2 whorls of 5; pistillode narrowly columnar ..... **Panda** (see Pandaceae)
35b Fruit not more than 30 mm in diameter, readily dehiscent:
37a Stipules fused into an elongate sheath ..... **Pseudagrostistachys**
37b Stipules small, free or obsolete:
38a Inflorescences axillary; pistillode (non-functional ovary) present:
39a Herbs ..... **Caperonia**
39b Shrubs or trees:
40a Male calyx lobes and petals (4)5(6) ..... **Cleistanthus**
40b Male calyx lobes 2 or 3; petals 3 ..... **Cyttaranthus**

38b Inflorescences terminal; pistillode absent:
41a Female petals shorter than the calyx. ..... Neoholstia
41b Female petals longer than the calyx:
42a Leaves penninerved; stamens 15–30; fruit 3–5-lobed ..... Cavacoa
42b Leaves palminerved; stamens 7–12; fruit subglobose ..... **Tannodia**

17b Petals absent:
43a Male calyx open in bud; milky latex often present:
44a Male flowers in dense ovoid or globose heads ..... **Maprounea**
44b Male flowers in narrow elongate spikes:
45a Fruit large, inflated ..... **Excoecaria**
45b Fruit small, not inflated:
46a Inflorescences dense at maturity ..... **Spirostachys**
46b Inflorescences lax at maturity:
47a Perennial herbs, glabrous ..... **Microstachys**
47b Shrubs to trees:
48a Plants glabrous ..... **Sclerocroton**
48b Plants with unbranched, multicellular, usually coloured hairs ..... **Shirakiopsis**
43b Male calyx closed in bud; milky latex usually absent:
49a Inflorescences involucrate:
50a Dioecious trees; involucral bracts 5–12 ..... **Uapaca**
50b Monoecious twiners; involucral bracts paired . ..... **Dalechampia**
49b Inflorescences not involuerate:
51a Fruit winged:
52a Climbers; leaves 3-lobed; fruit wings 4 ..... **Plukenetia**
52b Trees or shrubs; leaves entire; fruit wings 2 or 6:
53a Fruit 2-winged; stamens (4)5(6) ..... **Hymenocardia**
53b Fruit 6-winged; stamens 50 or more ..... **Pycnocoma**
51b Fruit smooth, pitted, wrinkled, warty or tubercled, but never winged:
54a Female calyx lobes pinnatifid:
55a Shrubs; indumentum stellate; male flowers capitate ..... **Cephalocroton**
55b Twiners; indumentum simple, usually urticating; male flowers racemose:
56a Styles united to form a tube or globose mass ..... **Tragiella**
56b Styles free above ..... **Tragia**
54b Female calyx lobes entire:
57a Male sepals imbricate:
58a Leaves usually palmately lobed to palmatipartite ..... ***Manihot**
58b Leaves simple, entire:
59a Fruits indehiscent, compressed; endocarp pitted ..... **Antidesma**
59b Fruits dehiscent, sometimes tardily so; endocarp usually smooth:
60a Inflorescences leaf-opposed ..... **Suregada**
60b Inflorescences axillary or cauliflorous:
61a Inflorescences spicate, racemose or paniculate:
62a Fruits ellipsoid, tardily dehiscent ..... **Maesobotrya**
62b Fruits 3-lobed, readily dehiscent:
63a Disc glands 5, free ..... **Thecacoris**
63b Disc glands absent ..... **Tetrorchidium**
61b Inflorescences fasciculate or glomerulate, or flowers solitary:
64a Disc absent ..... ***Breynia**
64b Disc present:
65a Male disc intrastaminal; fruit indehiscent ..... **Drypetes**
65b Male disc extrastaminal; fruit dehiscent, sometimes tardily so:
66a Pistillode absent:
67a Male disc annular; sarcotesta present, bluish ..... Margaritaria
67b Male disc of separate glands (except *P. pinnatus*); sarcotesta absent ..... Phyllanthus
66b Pistillode present:
68a Male disc annular:
69a Fruit thick-walled; female sepals deciduous; seeds with smooth testa ..... **Pseudolachnostylis**
69b Fruit thin-walled; female sepals persistent; seeds with sculptured testa ..... Meineckia
68b Male disc of separate glands:
70a Stamens free; fruit smooth, glabrous ..... Flueggea
70b Stamens connate; fruit tubercled, setose ..... Chaetocarpus

57b Male sepals valvate:
71a Female flowers usually subtended by accrescent bracts; styles laciniate; anthers vermiform ..... **Acalypha**
71b Female flowers not subtended by accrescent bracts: styles not laciniate but sometimes plumulose; anthers not vermiform:
72a Leaves palmatilobed, palmatifid or palmatipartite:
73a Robust herbs ..... ***Ricinus**
73b Trees or shrubs ..... **Macaranga**
72b Leaves not deeply lobed or divided:
74a Plants often drying purplish; anther thecae erect, separate:
75a Bud scales present, crustaceous to subcoriaceous, persistent ..... **Erythrococca**
75b Bud scales absent ..... **Micrococca**
74b Plants not usually drying purplish; anther thecae pendulous, usually contiguous:
76a Herbs ..... **Leidesia**
76b Trees or shrubs:
77a Anthers 3- or 4-thecous ..... **Macaranga**
77b Anthers 2-thecous:
78a Disc absent; stamens 8 or fewer ..... **Alchornea**
78b Disc present; stamens usually more than 8:
79a Leaves palminerved; indumentum stellate; inflorescences terminal ..... **Neoboutonia**
79b Leaves penninerved; indumentum simple; inflorescences terminal or axillary:
80a Inflorescences terminal ..... **Discoglypremna**
80b Inflorescences axillary:
81a Leaves with linear-lanceolate stipules; female sepals accrescent ..... **Paranecepsia**
81b Leaves exstipellate or stipules small and very early caducous; female sepals not accrescent:
82a Anther thecae free, at apex of 2-branched connective; styles plumulose ..... **Mareya**
82b Anther thecae at least partially adnate to the connective, longitudinally dehiscent; styles papillose:
83a Petioles often pulvinate and geniculate; styles bifid ..... **Necepsia**
83b Petioles very short or absent, not as above; styles simple ..... **Argomuellera**

Acalypha L.

(Acalyphoideae—Acalypheae)

Hutchinson: 880 (1912); Radcliffe-Smith: 287 (1973b); Radcliffe-Smith: 185 (1987); Radcliffe-Smith: 439 (1989); Webster: 90 (1994); Radcliffe-Smith: 182 (1996); Radcliffe-Smith: 234 (2001); White *et al.*: 241 (2001); Coates Palgrave: 509 (2002).

Sthn trop. Afr. ± 35, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Adenocline Turcz.

(Crotonoideae—Adenoclineae)

Webster: 101 (1994); Radcliffe-Smith: 247 (1996); Radcliffe-Smith: 279 (2001).

Sthn trop. Afr. 1: *Adenocline acuta* (Thunb.) Baill., Zimbabwe, Malawi, and sthn Afr.

Alchornea Sw.

(Acalyphoideae—Alchorneae)

Radcliffe-Smith: 435 (1974); Radcliffe-Smith: 251 (1987); Webster: 81 (1994); Radcliffe-Smith: 151 (1996); Radcliffe-Smith: 192 (2001); White *et al.*: 242 (2001); Coates Palgrave: 505 (2002).

Lepidoturus Baill.; White: 200 (1962) as synonym.

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Aleurites** J.R.Forst. & G.Forst.

(Crotonoideae—Aleuritideae)

White: 193 (1962); Radcliffe-Smith: 176 (1987); Webster: 114 (1994); Radcliffe-Smith: 330 (2001).

Sthn trop. Afr.: 2 recorded as cultivated in Zimbabwe, Malawi, Mozambique and sthn Afr., and may occur as escapes.

Amanoa Aubl.

(Phyllanthoideae—Amanoeae)

Aublet: 256 (1775); Hutchinson: 630 (1912); Pax & Hoffmann: 195 (1922); Keay: 371 (1958); Webster: 38 (1994); Radcliffe-Smith: 16 (2001); Dombo *et al.*: 9 (2002).

Trees, glabrous in all parts. **Leaves** alternate, petiolate, oblanceolate to oblong-elliptic, shortly and obtusely acuminate, deltoid at base, entire, coriaceous; stipules adnate to base of petiole. **Inflorescences** either bisexual or male; flowers in solitary, subglobose, sessile, terminal and axillary heads surrounded by coriaceous bracts, outer bracts keeled and mucronate, inner ones doubly keeled; bracteoles lanceolate, membranous. **Male flowers**: sepals 5, imbricate; petals 5, short, scale-like; stamens 5, arising within short, glabrous disc; filaments free, thick, short, episepalous; anthers ovoid, dehiscing introrsely by longitudinal slits; rudimentary ovary 3-lobed. **Female flowers**: sepals as in male flowers; petals sometimes obsolete; ovary subglobose, 3-locular; stigmas 3, sessile, discoid, thick; ovules 2 per locule. **Capsule** separating into 2-valved cocci. **Seeds** solitary by abortion, shining, testa crustaceous; endosperm thin or absent.

Species 16, tropical America, Africa and Madagascar; sthn trop. Afr. 1: *Amanoa strobilacea* Müll.Arg., Angola (Cabinda).

Andrachne L.

(Phyllanthoideae—Phyllantheae)

Radcliffe-Smith: 7 (1987); Hoffmann: 321 (1994); Webster: 42 (1994); Radcliffe-Smith: 27 (1996); Hoffmann: 123 (2000); Radcliffe-Smith: 32 (2001); Coates Palgrave: 467 (2002).

Sthn trop. Afr. 1: *Andrachne ovalis* (E.Mey. ex Sond.) Müll.Arg., Zimbabwe, and sthn Afr.

Androstachys Prain

(Oldfieldioideae—Picrodendreae)

Webster: 61 (1994); Radcliffe-Smith: 120 (1996); Radcliffe-Smith: 109 (2001).

Monotypic genus: *Androstachys johnsonii* Prain, Zimbabwe, Mozambique, and sthn Afr.

Anthostema A.Juss.

(Euphorbioideae—Euphorbieae)

Jussieu: 56 (1824); Hutchinson: 609 (1912); Pax & Hoffmann: 207 (1931); Keay: 416 (1958); Webster: 126 (1994); Radcliffe-Smith: 400 (2001).

Trees with glabrous branches. **Leaves** alternate, petiolate, oblong, entire, apex obtusely acuminate, base rounded; thinly coriaceous, shiny above; stipules apparently very early deciduous. **Inflorescences**: flowers in cyathia arranged in small, subsessile, rather dense, much-branched axillary cymes; bracts opposite, small; cyathia of 4–6 involucral bracts surrounding an ovary (female flower) surrounded on one side by 4 involucres of ± 8 free bracts, each involucre surrounding 7–13 stamens (male flowers). **Male flowers** each with a cup-like, 3–4-toothed perianth at its base, jointed to the pedicel and soon falling off; anthers 2-thecous, subglobose, opening longitudinally. **Female flower** (ovary) 3-locular, 3-lobed, ± sessile, with a cup-like, 3–4-toothed calyx; ovules 1 per locule, pendulous; style stout, with 3 short, spreading branches with entire, subtruncate stigmatic tips.

Species 3, trop. Africa and Madagascar; sthn trop. Afr. 1: *Anthostema aubryanum* Baill., Angola (Cabinda).

Antidesma L.

(Phyllanthoideae—Antidesmeae)

Léonard: 3 (1988); Radcliffe-Smith: 572 (1988); Webster: 52 (1994); Léonard: 16 (1995b); Radcliffe-Smith: 105 (1996); Radcliffe-Smith: 69 (2001); White *et al.*: 243 (2001); Coates Palgrave: 481 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Argomuellera Pax

(Acalyphoideae—Pycnocomeae)

Pax: 90 (1894); Burtt Davy *et al.*: 49 (1958); White: 194 (1962); Radcliffe-Smith: 225 (1987); Webster: 76 (1994); Léonard: 23 (1996a); Léonard: 56 (1996b); Radcliffe-Smith: 147 (1996); Radcliffe-Smith: 167 (2001); White *et al.*: 243 (2001); Coates Palgrave: 504 (2002).

Monoecious or subdioecious shrubs or small trees with a simple indumentum. **Leaves** alternate, shortly petiolate or subsessile, stipulate, simple, dentate to subentire, eglandular, penninerved. **Inflorescences** unisexual or bisexual, racemose, rarely subpaniculate, axillary, usually solitary per axil. **Male flowers**: calyx closed in bud, later splitting into (2)3 or 4(5) valvate lobes which become reflexed; petals absent; disc glands free, interstaminal; stamens 15–120, filaments free, anthers basifixed, introrse, longitudinally dehiscent, connective broad; pistillode absent. **Female flowers**: sepals 5 or 6(9), ± biseriate, imbricate; petals absent; disc annular; ovary 3-celled, with 1 ovule per cell; styles 3, connate at base, undivided, rather stout. **Fruits** 3-lobed, septicidally dehiscent into 3 bivalved cocci; endocarp thinly woody. **Seeds** globose, ecarunculate; endosperm fleshy; cotyledons broad, flat.

Species ± 10, trop. Africa and Madagascar; sthn trop. Afr. 1: *Argomuellera macrophylla* Pax, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Aristogeitonia Prain

(Oldfieldioideae—Picrodendreae)

Prain: 438 (1908); Hutchinson: 625 (1912); Radcliffe-Smith: 118 (1987); Webster: 61 (1994); Radcliffe-Smith: 106 (2001).

Monoecious trees; young shoots puberulous with simple indumentum. **Leaves** alternate, often crowded at apex of shoot, 1-foliolate or digitately 2- or 3-foliolate, of unequal size, petiolate; leaflets sessile, ovate-lanceolate, entire, coriaceous; stipules subulate. **Inflorescences**: flowers in fascicles in axils of fallen leaves on old wood; bracts minute. **Male flowers**: tepals 6, imbricate, 2-seriate; disc absent; stamens 11–15, filaments free, anthers ovoid, 2-thecate, dorsifixed, extrorse; pistillode 3–6-lobed. **Female flowers**: tepals ± as in male flowers but early caducous; disc annular, crenately lobed; ovary 3-locular, ovules 2 per locule, styles 3, short or obsolete, stigmas capitate, reniform. **Fruit** a 3-lobed capsule dehiscing septicidally into 3 bivalved cocci; endocarp crustaceous. **Seeds** ovoid, often only 1 per coccus by abortion; testa crustaceous, shiny.

Species 3, trop. Africa and Madagascar; sthn trop. Afr. 1: *Aristogeitonia limoniifolia* Prain, Angola.

*Breynia J.R.Forst. & G.Forst.

(Phyllanthoideae—Phyllantheae)

Forster & Forster: 145, t. 73 (1776) name conserved; Webster: 46 (1994); Radcliffe-Smith: 85 (1996); Radcliffe-Smith: 46 (2001).

Monoecious or apparently dioecious shrubs or small trees, with or without a simple indumentum, often blackening on drying. **Branching** phyllanthoid. **Leaves** alternate, shortly petiolate, stipulate, simple, entire, penninerved, borne on plagiotropic shoots (leafy or floriferous lateral shoots of limited growth). **Flowers** axillary, the male fasciculate or solitary, usually in the proximal axils, the female solitary, usually in the distal axils. **Male flowers**: pedicels often capillary; calyx obconic or turbinate, calyx lobes 6, imbricate, sharply inflexed; petals absent; disc absent; stamens 3, united into a short column, anthers elongate, thecae linear, extrorse, adnate to column, longitudinally dehiscent; pistillode absent. **Female flowers**: pedicels sometimes capillary; calyx lobes 6, imbricate, not inflexed, usually larger than in the male flowers, accrescent; disc absent; ovary 3-locular, ovules 2 per locule; styles 3, free, short, erect, simple or bifid. **Fruit** ± baccate, tardily and often incompletely loculicidally dehiscent;

exocarp sometimes somewhat fleshy; endocarp crustaceous. **Seeds** trigonous, ecarunculate; testa membranous; albumen fleshy; cotyledons broad; radicle long.

Species 10–15, Indo-Pacific tropics, some species are widely cultivated ornamentals, 1: **Breynia disticha* J.R.Forst. & G.Forst. is found as a garden escape in Zimbabwe and Mozambique.

Bridelia Willd.

(Phyllanthoideae—Bridelieae)

Hiern: 953 (1900) as *Briedelia*; Warburg: 461 (1903); Hutchinson: 611 (1912); Radcliffe-Smith: 120 (1987); Webster: 39 (1994) as *Briedelia*; Dressler: 337 (1996); Radcliffe-Smith: 12 (1996); Radcliffe-Smith: 19 (2001); White *et al.*: 244 (2001); Coates Palgrave: 488 (2002); Mapaura & Timberlake: 164 (2002).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Caperonia A.St.-Hil.

(Acalyphoideae—Chrozophoreae)

Radcliffe-Smith: 163 (1987); Webster: 71 (1994); Radcliffe-Smith: 138 (1996); Radcliffe-Smith: 140 (2001).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cavacoa J.Léonard

(Crotonoideae—Aleuritidae)

Radcliffe-Smith: 174 (1987); Webster: 115 (1994); Radcliffe-Smith: 304 (1996); Radcliffe-Smith: 335 (2001); White *et al.*: 246 (2001); Coates Palgrave: 499 (2002).

Sthn trop. Afr. 1: *Cavacoa aurea* (Cavaco) J.Léonard, Malawi, Mozambique, and sthn Afr.

Cephalocroton Hochst.

(Acalyphoideae—Epiprineae)

Radcliffe-Smith: 123 (1973a); Radcliffe-Smith: 282 (1987); Webster: 79 (1994); Radcliffe-Smith: 149 (1996); Radcliffe-Smith: 183 (2001).

Sthn trop. Afr. 1: *Cephalocroton mollis* Klotzsch, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chaetocarpus Thwaites

(Acalyphoideae—Chaetocarpeae)

Thwaites: 300 (1854) name conserved; Léonard: 127 (1962); Webster: 65 (1994); Radcliffe-Smith: 134 (1996); Radcliffe-Smith: 116 (2001).

Dioecious trees or shrubs, with a hirsute and sericeous indumentum. **Leaves** alternate, shortly petiolate, stipulate, simple, entire, penninerved, eglandular. **Flowers** in axillary fascicles, the male fascicles many-flowered, the female fascicles few-flowered; bracts minute. **Male flowers** small; pedicels short, jointed; sepals 4–6, free, imbricate; petals absent; disc glands extrastaminal, free; stamens 5–16, borne on a column, anthers extrorse, dorsifixed, connective broad, the cells longitudinally dehiscent; pistillode trifid, hairy. **Female flowers** small; pedicels short; sepals ± as in male flowers; petals absent; disc hypogynous, cupular, crenellate; ovary 3-celled, with 1 ovule per cell; styles 3, ± free, bifid or bipartite, stigmas fimbriate or papillose. **Fruit** ellipsoid-subglobose, dehiscing into bivalved cocci; exocarp tuberculate, setiferous, or both; endocarp woody; columella persistent. **Seeds** compressed-ovoid; testa crustaceous; caruncle bipartite, fleshy; albumen fleshy; cotyledons broad, flat.

Species 12, pantropical, 1 African: *Chaetocarpus africanus* Pax; sthn trop. Afr.: Angola, Zambia.

Chrozophora Neck. ex A.Juss.

(Acalyphoideae—Chrozophoreae)

Radcliffe-Smith: 160 (1987); Webster: 73 (1994); Radcliffe-Smith: 141 (1996); Radcliffe-Smith: 151 (2001).

Sthn trop. Afr. 1: *Chrozophora plicata* (Vahl) A.Juss. ex Spreng., Zambia, Zimbabwe, Mozambique, and sthn Afr.

Cleistanthus Hook.f. ex Planch.

(Phyllanthoideae—Bridelieae)

Léonard: 421 (1960); Radcliffe-Smith: 130 (1987); Webster: 38 (1994); Radcliffe-Smith: 8 (1996); Radcliffe-Smith: 18 (2001); White *et al.*: 246 (2001); Coates Palgrave: 487 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Clutia L.

(Acalyphoideae—Clutieae)

Hiern: 973 (1900); Radcliffe-Smith: 331 (1987); Webster: 64 (1994); Radcliffe-Smith: 123 (1996); Radcliffe-Smith: 113 (2001); Thompson & Edwards: 13 (2001); White *et al.*: 246 (2001); Bingham & Smith: 141 (2002); Coates Palgrave: 513 (2002); Msekandiana & Mlangeni: 35 (2002); Mapaura & Timberlake: 164 (2002).

Sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Codiaeum** A.Juss.

(Crotonoideae—Codiaeae)

Jussieu: 33 (1824) name conserved; Radcliffe-Smith: 324 (1987); Webster: 106 (1994); Radcliffe-Smith: 301 (2001).

Monoecious or occasionally dioecious shrubs or small trees with a simple indumentum, or glabrous. **Leaves** alternate, petiolate, minutely stipulate or stipules absent, simple, entire or 3-lobed, occasionally the lamina contorted or interrupted along the midrib, penninerved, eglandular or ± so. **Inflorescences** axillary or subterminal, racemose, solitary or paired, usually unisexual, pedunculate; male bracts 1–6-flowered; female bracts 1-flowered. **Male flowers**: pedicels slender, jointed; sepals (3)5(6), closely imbricate; petals (3)5(6), small, minute or 0; disc glands 5–15, free, alternipetalous; stamens 15–100, filaments free, anthers erect, extrorse, dorsifixed, connective broad, thecae apically confluent, longitudinally dehiscent; pistillode absent. **Female flowers**: pedicels shorter and stouter than in the male, not jointed; sepals smaller than in the male, otherwise ± similar; petals absent; disc shallowly cupular, subentire or shallowly 5-lobed; ovary 3-locular, 1 ovule per locule; styles 3, shortly connate at the base, spreading or recurved, usually simple. **Fruit** globose or 3-lobed, dehiscing septicidally into 3 bivalved cocci; pericarp thin; endocarp thinly woody; columella persistent. **Seeds** ovoid to subglobose, carun-

culate; testa smooth, shiny, marmorate, crustaceous; albumen fleshy; cotyledons broad, flat.

Species 16, ranging from Malaysia to N Australia and Polynesia; **Codiaeum variegatum* (L.) A.Juss. is widely cultivated in the tropics, often becoming naturalised.

Croton L.

(Crotonoideae—Crotoneae)

Hiern: 969 (1900); Léonard: 50 (1962); Radcliffe-Smith: 135 (1987); Dowsett-Lemaire & White: 77 (1990); Webster: 111 (1994); Radcliffe-Smith: 275 (1996); Retief & Condy: 64 (1997); Radcliffe-Smith: 319 (2001); White *et al.*: 247 (2001); Coates Palgrave: 492 (2002); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 164 (2002).

Sthn trop. Afr. 26, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Crotonogyne Müll.Arg.

(Crotonoideae—Aleuritideae)

Müller Argoviensis: 535 (1864a); Prain: 819 (1912); Léonard: 174 (1962); Webster: 116 (1994); Radcliffe-Smith: 342 (2001).

Shrubs or small trees, monoecious or dioecious; indumentum of young parts and inflorescence of simple or stellate hairs, or stellate to lepidote. **Leaves** alternate, scattered, shortly petiolate, oblanceolate-oblong, entire; stipules ovate, acuminate, with 2 large glands on upper surface where petiole joins blade. **Inflorescences** long, axillary, interrupted, simple, spike-like racemes. **Male flowers** small; calyx globose, slightly apiculate and closed in bud, usually lepidote, splitting into 2 or 3 valvate lobes; petals 5 or 6, almost free, adhering or fused into a glabrous tube 5- or 6-lobed at apex; stamens ± 15–20, filaments short, free, glabrous, anthers of 2 parallel thecae, adnate throughout to a rather broad connective, dehiscence longitudinal, subintrorse; receptacle ± conical, surrounded at base by a ring of extra-staminal glands; rudimentary ovary absent. **Female flowers** larger than male ones, on a rigid, elongated, accrescent pedicel; calyx (4)5-lobed, often glandular at base or on margin; petals (4)5(6), free, imbricate; disc cup-shaped, entire or lobed; ovary 3-carpellate and 3-locular; ovule 1 per locule; styles 3, free or slightly fused at base, each divided into 3–8 filiform lobes. **Capsule** 3-lobed, lepidote or pubescent, breaking into 3 2-valvate cocci; columella persistent. **Seeds** ± ellipsoid, without caruncle, brown overlaid with brown or yellowish blotches.

Species 15, tropical W Africa; sthn trop. Afr. 1: *Crotonogyne manniana* Müll.Arg., Angola.

Cyttaranthus J.Léonard

(Acalyphoideae—Agrostistachydeae)

Léonard: 286 (1955); Léonard: 180 (1962); Webster: 70 (1994); Radcliffe-Smith: 134 (2001).

Monoecious shrubs. **Leaves** alternate, petiolate, simple, subentire to dentate-glandular, 3-nerved at base and with a pair of elongated glands where petiole and blade meet; stipules very small, soon caducous. **Inflorescences**: unisexual, rarely bisexual racemes, axillary, cauline or rarely pseudoterminal, solitary or few-fascicled, lax; bracts fused to axis and forming a small cavity containing 2 slightly exserted bracteoles and an exserted flower, and in male flowers sometimes further bracteoles and 1 or 2 small flower buds. **Male flower** with pedicel articulated near base; calyx membranous, opening into 2 or 3 reflexed parts; petals 3, rarely 6–8, free, not imbricate; receptacle convex, covered with big glands; stamens 25–40, filaments free, arising between glands; anthers with almost free, pendent thecae, connective drawn out into a small point; without rudimentary ovule. **Female flower** on an accrescent pedicel jointed near base; sepals fused into a 3-dentate cup; petals absent; gynophore annular, hypogynous; ovary 3-carpellate and 3-locular; styles 3, bifid, shortly fused near base; ovule 1 per locule. **Capsule** lobed, splitting into (2)3 2-valvate cocci; columella persistent. **Seeds** subglobose, grey to brown, glabrous, without caruncle; cotyledons foliaceous; endosperm abundant.

Monotypic genus: *Cyttaranthus congolensis* J.Léonard (=*Mallotus subulatus* of authors, not of Müll.Arg.), W trop. Africa; sthn trop. Afr.: Angola (Cabinda). Extremely close to *Chondrostylis* Boerlage and perhaps not separable (Webster 1994: 70).

Dalechampia L.

(Acalyphoideae—Plukenetieae)

Radcliffe-Smith: 285 (1987); Webster: 95 (1994); Radcliffe-Smith: 238 (1996); Radcliffe-Smith: 262 (2001).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Discoglypremna Prain

(Acalyphoideae—Caryodendreae)

Prain: 317 (1911); Radcliffe-Smith: 222 (1987); Webster: 74 (1994); Léonard: 11 (1996b); Radcliffe-Smith: 155 (2001).

Dioecious trees with simple indumentum. **Leaves** alternate to pseudoverticillate, petiolate, simple, subentire to shallowly toothed, subtriplinerved and penninerved, with a pair of glands toward base of lamina; stipules soon deciduous. **Inflorescences** terminal, paniculate, panicle branches pseudospicate or racemose; bracts small to minute, entire, those of male inflorescences many-flowered, those of female ones 1-flowered. **Male flowers** on short articulate pedicels; calyx ovoid-ellipsoid in buds, later splitting into 3 or 4 valvate lobes; petals 0; disc composed of ± 15 densely pubescent extra- and intrastaminal glands; stamens (6–)8(–15), filaments free, fairly long, flexuose, anthers subapicifixed, introrse, thecae free at base, pendulous from a produced conical connective, each unequally bilocellate, with larger locellus on outside, ± longitudinally dehiscent; pistillode 0. **Female flowers** on short articulate pedicels; calyx (4)5-lobed, lobes valvate, later strongly reflexed; petals 0; disc composed of 6–8 thick scale-like glands truncate and pubescent at apex; ovary 3-locular, with 1 ovule per locule; styles 3, free, entire, recurved-spreading, fimbriate. **Fruit** 3-lobed, loculicidally dehiscent into 3 valves, or septicidally into 3 bivalved cocci; exocarp slightly fleshy; endocarp crustaceous; columella persistent, narrow, triquetrous. **Seeds** ovoid; exotesta pseudoarillate, fleshy, red; mesotesta thick, indurated, foveolate, shiny, black; endotesta distinct, grey; endosperm fleshy; cotyledons broad, flat.

Monotypic genus: *Discoglypremna caloneura* (Pax) Prain, trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Drypetes Vahl

(Phyllanthoideae—Drypeteae)

Hutchinson: 674 (1912); Keay: 377 (1958); Radcliffe-Smith: 88 (1987); Webster: 47 (1994); Radcliffe-Smith: 87 (1996); Radcliffe-Smith: 50 (2001); White *et al.*: 250 (2001); Coates Palgrave: 477 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Elaeophorbia Stapf

(Euphorbioideae—Euphorbieae)

Stapf: t. 2823 (1906); Croizat: 109 (1938); Carter: 533 (1988); Radcliffe-Smith: 415 (2001); Carter: 101 (2002).

Euphorbia L. in part; Hiern: 944 (1900).

Monoecious, glabrous trees with a large rounded crown and copious caustic milky latex; branches ascending or spreading, fleshy, spiny, terminal branchlets obtusely 5-angled, becoming cylindric; spine shields very obtusely triangular. **Leaves** persistent at branch apices, fleshy; petiole subtended by a pair of short spines and vestigial stipules; blade obovate, tapering to petiole, entire, apex rounded or slightly emarginate. **Inflorescences** with cyathia in simple or dichotomous axillary cymes; bracts paired, persistent; involucres shallowly cup-shaped with 5 spreading glands around rim and 5 alternating lobes with denticulate margins. **Male flowers**: bracteoles fan-shaped; stamens many, well exserted. **Female flower** subsessile or shortly pedicellate in fruit; perianth entirely absent; ovary 3-locular with thickened fleshy walls and 1 pendulous ovule per locule; styles very short, with thickened bifid stigmas. **Fruit** drupaceous: exocarp thick, fleshy; endocarp woody, with a pore at base and each locule marked with a shallow longitudinal groove and a pore between grooves near apex. **Seeds** without caruncle.

Species 4, tropical W Africa; sthn trop. Afr. 1: *Elaeophorbia luernii* Croizat (=*Euphorbia grandifolia* Hiern not of Haw.), Angola.

Endadenium L.C.Leach

(Euphorbioideae—Euphorbieae)

Leach: 31 (1973); Webster: 130 (1994); Radcliffe-Smith: 418 (2001); Carter: 102 (2002).

Monoecious, unarmed, lacticiferous, succulent shrubs up to 3 m high; stem ± cylindric, relatively slender; branches randomly or subverticillately arranged, arcuate-ascending or ascending, sparingly rebranched, knobby from somewhat tubercular leaf bases when young. **Leaves** deciduous, spirally arranged, often ± crowded towards apex of new growth, fleshy, rigid, obovate, glabrous, almost sessile, with a dark brown, often acute or spiky gland on each side at base; margin shallowly crenulate or serrulate, serrulations usually tipped with a small, brown, scarcely pungent tooth similar to apical mucro; upper surface ± flat to slightly concave, lower surface usually keeled. **Inflorescence** a compound dichasium of cernuous, bracteate heads, axillary on new season's growth; peduncle green, with a dark brown gland on each side at base. **Bract-cup** oblique, exceeding involucre, prominently bicarinate, broadly notched at apex for ± $^1/_3$ of its length, lobes not overlapping. **Involucre** ± broadly campanulate, inside with a ring of 12–15 pocket-like nectaries excavated in thickened wall of involucre; margin irregularly crenulate, tinged with red. **Male flowers** 35–40, glabrous, arranged in 5 fascicles, arising in shallow excavations in wall of lower part of involucre; bracteoles absent. **Female flower** reduced to a shortly pedicellate ovary with a rudimentary perianth; ovary 3-lobed, pubescent; ovule carunculate, suspended under a minutely fringed obturator; styles united at base into a column, free portions spreading; stigmas bifid, grooved on inner face.

Monotypic genus: *Endadenium gossweileri* (N.E.Br.) L.C.Leach, Angola. Perhaps not distinct from *Monadenium* (Webster 1994: 130).

Erythrococca Benth.

(Acalyphoideae—Acalypheae)

Hutchinson: 847 (1912); Radcliffe-Smith: 265 (1987); Webster: 87 (1994); Radcliffe-Smith: 165 (1996); Radcliffe-Smith: 216 (2001); White *et al.*: 252 (2001); Coates Palgrave: 501 (2002).

Claoxylon in sense of White: 195 (1962) as synonym.

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Euphorbia L.

(Euphorbioideae—Euphorbieae)

Leach: 31 (1974); Leach: 111 (1975); Leach: 1 (1976); Percy-Lancaster & Richards: 72 (1992); Carter: 368 (1994); Hargreaves: 175 (1994); Webster: 128 (1994); Carter & Eggli: 1 (1997); Carter & Leach: 1 (2001); Radcliffe-Smith: 405 (2001); White *et al.*: 253 (2001); Williamson: 58 (2001); Bingham & Smith: 141 (2002); Carter: 102 (2002); Coates Palgrave: 523 (2002); Dombo *et al.*: 9 (2002); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 164 (2002); Msekandiana & Mlangeni: 35 (2002).

Chamaesyce S.F.Gray: 260 (1821); Koutnik: 262 (1984); Webster: 129 (1994); Radcliffe-Smith: 415 (2001).

Sthn trop. Afr. 150, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. **Euphorbia leucocephala* Lotsy, an introduced ornamental, has become invasive, particularly in some urban areas [Coates Palgrave: 460 (2002)]. *Chamaesyce* is sometimes treated as a genus distinct from *Euphorbia*. The following characters in combination distinguish it from *Euphorbia*: Annual or perennial herbs with milky latex, with main axis aborting above cotyledons. **Leaves** opposite, inequilateral at base; veins surrounded by a chlorenchyma sheath; stipules present, interpetiolar. **Seeds** usually ecarunculate. Archer: 255 (2000) argues for considering *Chamaesyce* a subgenus of *Euphorbia*.

Excoecaria L.

(Euphorbioideae—Hippomaneae)

Radcliffe-Smith: 382 (1987); Webster: 122 (1994); Radcliffe-Smith: 315 (1996); Radcliffe-Smith: 360 (2001); White *et al.*: 253 (2001); Coates Palgrave: 517 (2002).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Flueggea Willd.

(Phyllanthoideae—Phyllantheae)

Webster: 259 (1984); Radcliffe-Smith: 68 (1987); Webster: 43 (1994); Radcliffe-Smith: 29 (1996); Radcliffe-Smith: 35 (2001); Coates Palgrave: 471 (2002).

Securinega of various authors, in part; White: 204 (1962); White *et al.*: 259 (2001).

Sthn trop. Afr. 1: *Flueggea virosa* (Roxb. ex Willd.) Voigt, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Heywoodia Sim

(Phyllanthoideae—Wielandieae)

Radcliffe-Smith: 85 (1987); Webster: 36 (1994); Radcliffe-Smith: 6 (1996); Radcliffe-Smith: 6 (2001); Coates Palgrave: 469 (2002).

Monotypic genus: *Heywoodia lucens* Sim; sthn trop. Afr.: Mozambique, and sthn Afr.

Hymenocardia Wall. ex Lindl.

(Phyllanthoideae—Hymenocardieae)

Léonard & Mosango: 469 (1985); Radcliffe-Smith: 577 (1988) under Hymenocardiaceae; Webster: 53 (1994); Radcliffe-Smith: 113 (1996); Radcliffe-Smith: 74 (2001); Coates Palgrave: 480 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Jatropha L.

(Crotonoideae—Jatropheae)

Hiern: 968 (1900); Radcliffe-Smith: 343 (1987); Percy-Lancaster & Richards: 72 (1992); Webster: 103 (1994); Radcliffe-Smith: 253 (1996); Radcliffe-Smith: 288 (2001); Bingham & Smith: 141 (2002); Carter: 203 (2002); Coates Palgrave: 512 (2002).

Sthn trop. Afr. 25 (including naturalised spp.), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Leidesia Müll.Arg.

(Acalyphoideae—Acalypheae)

Webster: 85 (1994); Radcliffe-Smith: 159 (1996); Radcliffe-Smith: 206 (2001).

Monotypic genus: *Leidesia procumbens* L., sthn trop. Afr.: Zimbabwe, Mozambique, and sthn Afr.

Macaranga Thouars

(Acalyphoideae—Acalypheae)

Hiern: 981 (1900); Radcliffe-Smith: 239 (1987); Webster: 86 (1994); Radcliffe-Smith: 161 (1996); Radcliffe-Smith: 213 (2001); White *et al.*: 253 (2001); Coates Palgrave: 508 (2002).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Maesobotrya Benth.

(Phyllanthoideae—Antidesmeae)

Bentham: t. 1296 (1879); Radcliffe-Smith: 112 (1987); Léonard: 3 (1994); Webster: 50 (1994); Léonard: 46 (1995b); Radcliffe-Smith: 103 (1996); Radcliffe-Smith: 60 (2001).

Dioecious trees or shrubs with a simple indumentum. **Leaves** alternate, often long-petiolate, stipulate, simple, entire or toothed, penninerved; petioles bipulvinate; stipules minute and deciduous (or foliaceous and persistent elsewhere). **Inflorescences** axillary (or cauliflorous elsewhere), solitary (or fasciculate elsewhere), racemose (or subspicate elsewhere); bracts usually 1-flowered; flowers shortly pedicellate. **Male flowers**: calyx (4)5-lobed, imbricate; petals absent; disc glands (4)5, alternating with the stamens, fleshy, contiguous; stamens (4)5(6), opposite the sepals; filaments free; anthers erect, dorsifixed, introrse, thecae parallel, longitudinally dehiscent; pistillode cylindric, not lobed. **Female flowers**: calyx as in the male; petals absent; disc hypogynous, cupular, entire; ovary (1)2(4)-locular, with 2 ovules per locule; styles short; stigmas bifid, recurved. **Fruit** subglobose or ellipsoid, subdrupaceous, tardily loculicidally dehiscent; pericarp thin; endocarp 1-locular by suppression. **Seeds** solitary by abortion, ellipsoid, ecarunculate; testa thin; albumen copious; cotyledons broad, flat, green.

Species ± 20, all in W trop. Africa, except 1 in Uganda; sthn trop. Afr. 2 (but most probably further spp. in N Angola), Angola, Zambia.

Mallotus Lour.

(Acalyphoideae—Acalypheae)

Loureiro: 635 (1790); Hiern: 980 (1900); White: 201 (1962); Radcliffe-Smith: 235 (1987); Webster: 89 (1994); Radcliffe-Smith: 179 (1996); Radcliffe-Smith: 225 (2001); White *et al.*: 254 (2001); Coates Palgrave: 504 (2002); Mapaura & Timberlake: 164 (2002).

Dioecious, or rarely monoecious trees or shrubs often with a stellate, or sometimes simple or mixed, indumentum. **Leaves** opposite or alternate, sometimes anisophyllous, petiolate, stipulate, sometimes lobed, entire or toothed, with 2 or more basal glands on upper surface, and often pellucid-gland-dotted on upper and lower surfaces, penni- or palminerved. **Inflorescence**s unisexual, spicate, racemose or paniculate, terminal, subterminal or axillary, few- to many-flowered; male flowers commonly in fascicles along the axis, female flowers 1 or 2 per bract. **Male flowers**: calyx usually globose in bud, later valvately (2)3–4(5)-partite; petals absent; disc glands absent or many, free, dispersed amongst stamens; stamens many, on a slightly elevated receptacle, filaments free, anthers subdorsifixed with a variable connective, longitudinally dehiscent; pistillode absent or rarely minute. **Female flowers**: calyx shallowly to deeply imbricately or valvately 3–5(–10)-lobed, persistent, or subspathaceous and caducous; petals absent; disc absent; ovary (2)3(4)-locular, with 1 ovule per locule; styles free or connate at base, simple, recurved, papillose or plumose. **Fruit**s globose or (2)3(4)-lobed, smooth or echinate, dehiscing septicidally into bivalved cocci leaving a ± 3-winged persistent columella; endocarp crustaceous. **Seeds** globose or ovoid, ecarunculate, outer testa slightly fleshy or soft, inner testa crustaceous, smooth or rugulose, endosperm fleshy, cotyledons broad, flat.

Species ± 140, Old World, in the Indo-Pacific area, with 2 species in trop. Africa; sthn trop. Afr. 1: *Mallotus oppositifolius* (Geisel.) Müll.Arg., Angola, Zambia, Malawi, Mozambique.

***Manihot** Mill.

(Crotonoideae—Manihoteae)

White: 201 (1962); Webster: 99 (1994); Radcliffe-Smith: 244 (1996); Radcliffe-Smith: 273 (2001); Phiri (Unpublished).

Sthn trop. Afr. 4 recorded as widely cultivated throughout the region and may occur as escapes. Also present in sthn Afr.

Manniophyton Müll.Arg.

(Crotonoideae—Aleuritideae)

Müller Argoviensis: 530 (1864a); Hiern: 972 (1900); Burtt Davy *et al.*: 52 (1958); Keay: 400 (1958); Léonard: 171 (1962); Webster: 116 (1994); Radcliffe-Smith: 343 (2001).

Shrubs or climbers, usually dioecious, scabrous with short stellate or simple hairs; stem exuding a red resin. **Leaves** alternate, petiolate, varying from simple and ovate to 3(5)-lobed, cordate and with 5 veins, and often with several ± bottle-shaped glands at base, tips acutely acuminate. **Inflorescences**: axillary, usually paired, elongate, usually sparsely branched panicles. **Male flowers** small, clustered in slender panicles; calyx valvate, opening irregularly into 2 or 3 entire or bi- to trifid parts; petals fused into a scarcely lobed tube; disc of 5 or 6 episepalous, hairy glands; stamens 10–20, arising on a convex receptacle, filaments free, erect, unequal, anthers cordate, 2-thecous, introrse, dehiscing longitudinally; rudimentary ovule absent. **Female flowers** in panicles much smaller than those of male flowers; sepals 5, fused in lower part to almost free; petals 5, free, imbricate, larger and longer than calyx, patent at flowering time; disc annular, hirsute; ovary 3-carpellate and 3-locular, sessile on disc, densely hispid; styles almost free, 2-partite, reflexed, glabrous. **Capsule** deeply 3-lobed, large, rusty-tomentose, splitting into 3 bivalvate cocci; columella persistent. **Seeds** ellipsoid to subglobose, glabrous, without caruncle, grey to dark brown.

Monotypic genus: *Manniophyton africanum* Müll.Arg., trop. Africa; sthn trop. Afr.: Angola, Malawi.

Maprounea Aubl.

(Euphorbioideae—Hippomaneae)

Léonard: 142 (1962); Radcliffe-Smith: 395 (1987); Webster: 123 (1994); Radcliffe-Smith: 325 (1996); Radcliffe-Smith: 392 (2001); Coates Palgrave: 522 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mareya Baill.

(Acalyphoideae—Acalypheae)

Baillon: 73 (1860); Radcliffe-Smith: 216 (1987); Léonard: 18 (1996b).

Trees or shrubs, monoecious, without latex; indumentum of simple hairs. **Leaves** alternate, simple, shortly petiolate, entire to glandular-serrate, with 2 basal glands, penninerved, often with translucid dots and often at base of upper surface with 2 short filiform or glanduliform appendages; stipulate. **Inflorescences** usually bisexual, spicate or racemose, axillary, with laxly flowered glomerules usually consisting of 1 female flower and 2 or more male flowers. **Flowers** very small, fragrant; pedicel long to 0, not jointed. **Male flowers**: calyx subglobose and apiculate, valvately splitting into 3 or 4 sepals; petals 0; disc glands many, free, minute; stamens 10–40, filaments free, filiform, anther connective divided into 2 branches, thecae free, at apex of branches, pendulous in bud, at length flexuous-divaricate, dehiscing distally; pistillode usually 0; receptacle convex. **Female flowers**: sepals 3–6, imbricate, ± free; petals 0; disc flattened, deeply 3–6-lobed with lobes opposite sepals; ovary 3-locular, with 1 ovule per locule; styles 3, ± free, accumbent on ovary, laciniate-plumulose. **Fruit** deeply 3-lobed, dehiscing septicidally into 3 bivalved cocci leaving a persistent columella; exocarp puberulous; endocarp woody. **Seeds** subglobose, smooth, ecarunculate; testa thinly crustaceous to chartaceous; endosperm fleshy; cotyledons broad, flat.

Species 3, trop. Africa; sthn trop. Afr. 1: *Mareya micrantha* (Benth.) Müll. Arg., Angola (Cabinda).

Margaritaria L.f.

(Phyllanthoideae—Phyllantheae)

Radcliffe-Smith: 63 (1987); Webster: 44 (1994); Radcliffe-Smith: 32 (1996); Radcliffe-Smith: 37 (2001); Coates Palgrave: 476 (2002).

Sthn trop. Afr. 1: *Margaritaria discoidea* (Baill.) G.L.Webster, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Meineckia Baill.

(Phyllanthoideae—Phyllantheae)

Radcliffe-Smith: 76 (1987); Webster: 41 (1994); Radcliffe-Smith: 27 (2001). *Cluytiandra* Müll.Arg.; Hiern: 956 (1900); Hutchinson: 738 (1912).

Monoecious or dioecious, ± glabrous shrubs or subherbaceous undershrubs. **Leaves** alternate, distichous, at least shortly petiolate, simple, entire, penninerved. **Inflorescences**: flowers axillary, in unisexual or bisexual fascicles; if unisexual, male flowers several per fascicle, female flowers usually solitary. **Male flowers** on long, very slender pedicels; sepals 5, imbricate; petals 0; disc annular or patelliform, slightly lobed, lobes opposite sepals; stamens 5; filaments partly to almost entirely fused into a stout column; anthers quadrilobate, extrorse, laterally dehiscent; pistillode cylindric, 3-lobed or ± entire, at apex of staminal column. **Female flowers** on very long, slender pedicels distinctly articulate near base; sepals and disc as in male flowers; ovary 3-locular, smooth, glabrous, with 2 ovules per locule; styles 3, slightly connate at base, bipartite or deeply bifid; stigmas usually capitate. **Fruits** 3-lobed, dehiscing septicidally into 3 bivalved cocci, leaving a persistent columella; endocarp thinly woody. **Seeds** often 1 per locule due to abortion, reniform, pitted, ecarunculate; endosperm copious; cotyledons broad, flat; radicle more than half as long as cotyledons, bent.

Species ± 20, tropics of Old and New World; sthn trop. Afr. 1: *Meineckia phyllanthoides* Baill. subsp. *trichopoda* (Müll.Arg.) Webster, Angola.

Micrococca Benth.

(Acalyphoideae—Acalypheae)

Prain: 876 (1912); Radcliffe-Smith: 261 (1987); Webster: 88 (1994); Radcliffe-Smith: 176 (1996); Radcliffe-Smith: 219 (2001); Coates Palgrave: 500 (2002).

Claoxylon in sense of Hiern: 975 (1900).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Microstachys A.Juss.

(Euphorbioideae—Hippomaneae)

Jussieu: 48 (1824); Esser: 955 (1998); Esser: 365 (2001b).

Sapium Jacq. in part as to some African species; Léonard: 151 (1962);

Radcliffe-Smith: 318 (1996).

Monoecious perennial herbs with several short erect stems arising from a thick, much-branched woody rootstock; indumentum of multicellular, branched or unbranched, colourless hairs; latex white. **Leaves** alternate, shortly petiolate, blades simple, obovate, elliptic, lanceolate or linear, entire to minutely serrulate, often with 1 or 2 glands on the margin towards the base; stipules minute, soon deciduous. **Inflorescences** terminal on main axes, overtopped by lateral leafy shoots, spicate or racemiform, mostly male with 1–4 female flowers at base. **Male flowers** with short pedicels; calyx lobes 3(4), triangular, with reddish tinge; petals 0; stamens 3(4), free; male bracts with 2 fleshy stipitate glands, one on each side. **Female flowers** subsessile to shortly stalked in fruit; calyx lobes 3(4), larger than in male flowers, often alternating with minute glands; ovary 3-lobed, each lobe with 2 (or more) ± conical appendages, styles 3. **Fruit** 3-lobed, septicidally dehiscent into 3 bivalved cocci, each valve with a small appendage. **Seeds** subcylindric, smooth, slightly shiny, pale grey, with a fleshy caruncle.

Species ± 15, pantropical: 1 in Asia and Australia, 3 or 4 in Africa, the remainder in S America; sthn trop. Afr. 1: *Microstachys acetosella* (Milne-Redh.) Esser (= *Sapium acetosella* Milne-Redh.), Angola, Zambia.

Mildbraedia Pax

(Crotonoideae—Crotoneae)

Pax: 319 (1909); Léonard: 85 (1962); Radcliffe-Smith: 340 (1987); Webster: 111 (1994); Radcliffe-Smith: 273 (1996); Radcliffe-Smith: 317 (2001).

Dioecious shrubs or small trees; indumentum stellate, sometimes also simple. **Leaves** alternate, stipulate, long-petiolate, simple, entire or sometimes (in west and central Africa) deeply 2–3-lobed, subentire to repand-dentate, palminerved; stipules subulate, deciduous. **Inflorescence**s axillary or supra-axillary, solitary, pedunculate, simply racemose or with flowers in racemes of 1-flowered (female inflorescences) or many-flowered (male inflorescences) cymes; bracts resembling stipules. **Male flowers**: calyx deeply 5(6)-lobed, or sepals free, imbricate; petals 5(6), free, imbricate; disc glands 5, free, fleshy, opposite sepals; stamens 10–25, outer ones ± free, inner ones united into a column, anthers small, introrse, dorsifixed, longitudinally dehiscent; pistillode absent. **Female flowers**: sepals and petals resembling those of male flowers, but slightly larger; disc hypogynous, annular, shallowly 5-lobed; ovary 3-locular, with 1 ovule per locule; styles 3, slightly connate at base, deeply bifid to bipartite, spreading. **Fruit** 3-lobed, dehiscing septicidally into 3 bivalved cocci; endocarp thinly woody; columella persistent. **Seed**s ovoid-subglobose; testa crustaceous, smooth, somewhat shiny, mottled; caruncle foliaceous, appressed.

Species 4, trop. Africa; sthn trop. Afr. 2, Angola, Mozambique.

Monadenium Pax

(Euphorbioideae—Euphorbieae)

Bally: 14 (1961); Leach: 35 (1973); Carter: 540 (1988); Webster: 129 (1994); Carter: 435 (2000); Carter & Leach: 438 (2001); Radcliffe-Smith: 417 (2001); Bingham & Smith: 141 (2002); Carter: 213 (2002).

Species >70, trop. Africa; sthn trop. Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Necepsia Prain

(Acalyphoideae—Bernardieae)

Prain: 343 (1910); Bouchat & Léonard: 179 (1986); Radcliffe-Smith: 218 (1987); Webster: 75 (1994); Léonard: 32 (1996b); Radcliffe-Smith: 143 (1996); Radcliffe-Smith: 160 (2001); Coates Palgrave: 506 (2002); Mapaura & Timberlake: 164 (2002).

Dioecious or monoecious trees with a simple indumentum; buds often with protective scales. **Leaves** alternate, petiolate, stipulate, simple, crenate-serrate to subentire, chartaceous or subcoriaceous, penninerved, sparingly gland-dotted on lower surface; petioles often pulvinate and geniculate. **Inflorescences** axillary, solitary or congested, pedunculate or sessile, spicate, racemose or subpaniculate, unisexual or bisexual; bracts rigid, ± scarious. **Male flowers** shortly pedicellate; calyx closed in bud, ovoid, apiculate, later splitting into 4 or 5 valvate lobes; petals absent; stamens many, inserted on a globose receptacle, filaments free, anthers with slightly oblique pendulous thecae, apicifixed, introrse, longitudinally dehiscent, connective produced; disc glands free; pistillode absent. **Female flowers** subsessile or very shortly pedicellate; sepals (4)5(6), imbricate, persistent; petals absent; disc hypogynous, annular or cupuliform, entire or ± crenulate, thick, pubescent or setose; ovary 3-celled, with 1 ovule per cell; styles 3, ± free or connate at base, bifid or bipartite, papillose. **Fruit** tricoccous, or dicoccous by abortion, dehiscing septicidally into 3 bivalved cocci leaving a columella; endocarp thinly woody. **Seeds** subglobose, ecarunculate.

Species 3, tropical Africa and Madagascar; sthn trop. Afr. 2, Angola, Zimbabwe.

Neoboutonia Müll.Arg.

(Crotonoideae—Aleuritideae)

Müller Argoviensis: 336 (1864b); White: 201 (1962); Radcliffe-Smith: 437 (1974); Radcliffe-Smith: 231 (1987); Webster: 116 (1994); Radcliffe-Smith: 310 (1996); Radcliffe-Smith: 344 (2001); White *et al.*: 256 (2001); Coates Palgrave: 507 (2002).

Dioecious, or rarely monoecious trees or shrubs with a stellate and sometimes also simple indumentum. **Leaves** alternate, long-petiolate, stipulate, simple, large, ± entire, minutely gland-dotted, palminerved. **Inflorescences** paniculate, terminal; male inflorescences larger and more branched than the female. **Male flowers**: calyx closed in bud, later splitting into 2 or 3 valvate lobes; petals absent; disc glands extrastaminal, minute; stamens 15–40, filaments free, short, anthers basifixed, introrse, longitudinally dehiscent; pistillode absent. **Female flowers**: calyx 5- or 6-lobed, lobes imbricate; petals absent; disc annular; ovary usually 3-locular, with 1 ovule per locule; styles usually 3, connate at base, deeply bipartite, rigid, recurved-patent. **Fruit** usually 3-lobed, septicidally dehiscent into 3 bivalved cocci; endocarp woody. **Seeds** ovoid or ellipsoid, carunculate; testa crustaceous; albumen fleshy; cotyledons broad, flat.

Species 3, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Neoholstia Rauschert

(Crotonoideae—Aleuritideae)

Rauschert: 559 (1982); Radcliffe-Smith: 169 (1987); Webster: 115 (1994) under *Tannodia* Baill.; Radcliffe-Smith: 308 (1996); Radcliffe-Smith: 340 (2001); Coates Palgrave: 500 (2002).

Holstia Pax; White: 199 (1962).

Dioecious, or rarely monoecious shrubs or small trees; indumentum simple; buds with protective scales. **Leaves** alternate, petiolate, stipulate, simple, subentire to dentate or lobed, palminerved. **Inflorescences** terminal, interruptedly racemose or subpaniculate; bracts small, 1–several-flowered. **Male flowers**: pedicels jointed; calyx closed in bud, later splitting into 2–5 valvate lobes; petals (4)5, short, free, imbricate; disc glands 5, free, alternating with petals; stamens 8–13, connate at base, anthers basifixed, introrse, thecae parallel, longitudinally dehiscent; pistillode absent. **Female flowers**: pedicels jointed; sepals 5, free, subequal, imbricate; petals 5, short, free, imbricate; disc shallowly cupular, lobulate; ovary 3-locular, with 1 ovule per locule; styles 3, ± free, bipartite. **Fruits** 3-lobed, dehiscing septicidally into 3 bivalved cocci; endocarp thinly woody; columella ± absent or not persistent. **Seeds** subecarunculate; testa crustaceous; albumen fleshy; embryo straight; cotyledons broad, flat.

Monotypic genus: *Neoholstia tenuifolia* (Pax) Rauschert, confined to SE trop. Africa; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique.

Oldfieldia Benth. & Hook.

(Oldfieldioideae—Picrodendreae)

Bentham & Hooker: 184 (1850); Léonard: 338 (1956); Radcliffe-Smith: 114 (1987); Webster: 61 (1994); Radcliffe-Smith: 117 (1996); Radcliffe-Smith: 104 (2001).

Paivaeusa Welw. ex Benth.; Burtt Davy *et al.*: 52 (1958).

Dioecious pachycaul trees or shrubs with a simple indumentum; twigs with prominent leaf scars; buds with protective scales. **Leaves** alternate, opposite-decussate or verticillate in whorls of 3, long-petiolate, exstipulate, digitately 3–8-foliolate; leaflets subsessile or petiolulate, entire, penninerved, brochidodromous. **Inflorescences** axillary, solitary or geminate, cymose; male inflorescences subsessile or pedunculate, many-flowered, lax or capitate; female inflorescences pedunculate, peduncles extending in fruit, 1–3-flowered. **Male flowers** small, shortly pedicellate; sepals 5–8, unequal, united at base, imbricate; petals absent; stamens 4–12, free, filaments arising between lobes of disc, unequal, anthers dorsifixed, extrorse, minutely papillose, longitudinally widely dehiscent; disc central, thick, fleshy, lobate-sinuate, pubescent; pistillode filiform, minute or absent. **Female flowers**: pedicels very short, lengthening slightly in fruit; sepals longer, narrower and stouter than in male, but otherwise similar, persistent in fruit; disc hypogynous, annular, short, fleshy, crenellate; ovary 2- or 3-locular, with 2 ovules per locule; styles 2 or 3, short, connate at base; stigmas ± reniform, shallowly 2–4-lobulate, caducous. **Fruit** 2- or 3-locular, depressed obovoid-subglobose, tardily loculicidally dehiscent into 2 or 3 valves each with an attached septum; pericarp coriaceous; mesocarp crustaceous; endocarp chartaceous; columella persistent, often with seeds attached. **Seeds** 1 or 2 per locule, usually 3 per fruit, somewhat compressed; exotesta fleshy; endotesta crustaceous; funicle thickened, carunculoid; endosperm fleshy; embryo green, cotyledons broad, flat.

Species 4, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Malawi, Mozambique.

Paranecepsia Radcl.-Sm.

(Acalyphoideae—Bernardieae)

Radcliffe-Smith: 684 (1976); Radcliffe-Smith: 220 (1987); Webster: 75 (1994); Radcliffe-Smith: 145 (1996); Radcliffe-Smith: 162 (2001).

Dioecious tree with a simple indumentum. **Leaves** alternate, crowded at ends of branchlets, shortly petiolate, stipulate, stipellate, simple, serrate, penninerved. **Inflorescences** racemose, axillary, solitary, lax; bracts 1–5-flowered. **Male flowers**: pedicels jointed; calyx closed in bud, later splitting into 3–5 valvate lobes which become reflexed; petals absent; disc glands free, interstaminal; stamens 25–40, filaments free, anthers dorsifixed, introrse, pendulous, longitudinally dehiscent; pistillode absent; receptacle subglobose. **Female flowers**: pedicels elongate, jointed; sepals 5–7, imbricate, unequal, accrescent; petals absent; staminodes 8–10; disc annular; ovary 3-celled, with 1 ovule per cell; styles 3, connate at base, bifid, papillose. **Fruit** 3-lobed, septicidally dehiscent into 3 bivalved cocci; endocarp thinly woody. **Seeds** globose, ecarunculate.

Monotypic genus: *Paranecepsia alchorneifolia* Radcl.-Sm., endemic to E and S trop. Africa; sthn trop. Afr.: Mozambique.

Phyllanthus L.

(Phyllanthoideae—Phyllantheae)

Radcliffe-Smith: 9 (1987); Webster: 44 (1994); Radcliffe-Smith: 36 (1996); Radcliffe-Smith: 38 (2001); White *et al.*: 256 (2001); Carter: 227 (2002); Coates Palgrave: 472 (2002).

Sthn trop. Afr. 71, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Plukenetia L.

(Acalyphoideae—Acalypheae)

Prain: 949 (1912); Prain: 496 (1920); Webster: 93 (1994); Radcliffe-Smith: 247 (2001).

Pterococcus Hassk.: 42 (1842) not of Pallas, name conserved; Radcliffe-Smith: 210 (1996).

Species ± 15, mostly neotropical but with 3 in Africa; sthn trop. Afr. 2, Angola, and sthn Afr.

Pseudagrostistachys Pax & K.Hoffm.

(Acalyphoideae—Agrostistachydeae)

Pax & Hoffmann: 96 (1912); Léonard: 183 (1962); Radcliffe-Smith: 166 (1987); Webster: 70 (1994); Radcliffe-Smith: 136 (1996); Radcliffe-Smith: 133 (2001).

Dioccious shrubs or small trees; indumentum simple (± confined to inflorescences). **Leaves** alternate, petiolate, stipulate, stipellate or not, simple, entire, subentire or remotely and shallowly serrulate-denticulate, penninerved, with 2–4 glands at top of petiole or on upper surface of lamina at base. **Stipules** fused into an elongate sheath, which on falling leaves a distinct annular scar. **Inflorescences** axillary or borne on old

wood, racemose, solitary or fasciculate, shortly pedunculate or not, strobiliform at first, later laxly flowered; bracts broad, concave, ciliate, persistent; male inflorescences 1–more-flowered; female inflorescences usually 1-flowered; bracteoles 2. **Male flowers** pedicellate, pedicels jointed near base; calyx closed in bud, later splitting into 2–5 membranous valvate lobes; petals 5–8, free, imbricate; receptacle convex, covered in contiguous disc glands, pubescent; stamens 20–55, free, erect in bud, arising from pits in the glandular surface, anthers fixed at apex, extrorse, thecae almost free, pendulous from a thickened glandular apiculate connective, longitudinally dehiscent; pistillode reduced or absent. **Female flowers**: pedicels stouter than in male, jointed near base; calyx and petals resembling those of the male; disc hypogynous, annular, thickened, alveolate; staminodes often present, filiform, arising from alveoli; ovary 3-locular, with 1 ovule per locule; styles 3, almost free, bipartite, stigmas papillose. **Fruit** 3-locular, dehiscing into 3 bivalved cocci; endocarp thinly woody; columella persistent, apically tricornute. **Seeds** subglobose, ecarunculate; testa crustaceous, shiny; albumen thick, fleshy; embryo straight or slightly curved; cotyledons broad, flat.

Species 2, trop. Africa; sthn trop. Afr. 1: *Pseudagrostistachys ugandensis* (Hutch.) Pax & K.Hoffm., Zambia.

Pseudolachnostylis Pax

(Phyllanthoideae—Phyllantheae)

Radcliffe-Smith: 80 (1987); Webster: 41 (1994); Radcliffe-Smith: 22 (1996); Radcliffe-Smith: 28 (2001); Coates Palgrave: 470 (2002).

Monotypic genus: *Pseudolachnostylis maprouneifolia* Pax; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pycnocoma Benth.

(Acalyphoideae—Pycnocomeae)

Bentham: 508 (1849); Hiern: 983 (1900); Prain: 955 (1912); Pax & Hoffmann: 52 (1914); Radcliffe-Smith: 228 (1987); Webster: 76 (1994); Léonard: 37 (1996c); Radcliffe-Smith: 166 (2001).

Monoecious shrubs or small trees, glabrous except tips and inflorescence with indumentum of simple hairs. **Leaves** alternate to pseudoverticillate, usually clustered towards ends of branches, subsessile to shortly petiolate, oblanceolate or elliptic-oblong, entire except in upper dentate-serrate part, penninerved; stipules caducous. **Inflorescences** bisexual, racemose, in upper leaf axils, each raceme with many male flowers in 1- to few-flowered clusters along rachis, and usually only 1 female flower at apex; rachis puberulous; bracts ovate, densely silky outside. **Male flowers**: pedicels usually long; calyx ovoid in bud, later 3- or 4(5)-partite, sepals reflexed; petals 0; disc glands many; stamens 50 or more, arising among disc glands on a hemispherical receptacle; filaments free, flexuose, anthers small, subglobose, subdorsifixed, longitudinally dehiscent; pistillode 0. **Female flowers**: sepals (4)5(6), imbricate, biseriate; petals 0; disc 0; ovary 3-locular, 6-winged or -horned, with 1 ovule per locule; styles 3, usually connate below into a column, free above and erecto-patent, stigmas capitate or slightly dilated. **Fruits** 3-lobed, 6-winged or -horned, dehiscing septicidally into 3 bivalved cocci, each valve 1-winged or -horned, leaving a persistent columella; endocarp thinly woody. **Seeds** ovoid-trigonous or subglobose, ecarunculate; endosperm fleshy; cotyledons broad, flat.

Species ± 15, trop. Africa; sthn trop. Afr. only 1 recorded: *Pycnocoma dentata* Hiern, Angola.

Ricinodendron Müll.Arg.

(Crotonoideae—Ricinodendreae)

Müller Argoviensis: 533 (1864a); Webster: 113 (1994); Radcliffe-Smith: 294 (1996); Radcliffe-Smith: 328 (2001).

Dioecious pachycaul trees with easily detached stellate indumentum. **Leaves** alternate, long-petiolate, palmatipartite to palmatisect; petioles sometimes glandular at apex; leaf segments sometimes pseudopetiolulate, glandular-denticulate, penninerved; stipules persistent, large, foliaceous, sessile, palmatifid, glandular-dentate. **Inflorescences** terminal or subterminal, paniculate, male larger than female; bracts linear, setaceous. **Male flowers** shortly pedicellate; buds globose; calyx lobes 4 or 5, imbricate; petals 5, imbricate, laterally coherent; disc glands 4–6, free, extrastaminal, entire, fleshy; stamens 6–14, filaments united at base, anthers dorsifixed, introrse, longitudinally dehiscent; pistillode absent. **Female flowers** pedicellate; calyx lobes 5, imbricate; petals ± as in male flowers; hypogynous disc crenulate; ovary 2- or 3-lobed, usually wider than long; pericarp coriaceous; mesocarp fleshy; endocarps 2(3), rarely 1 by abortion, distinct, each subglobose, 1-locular, 1-seeded, thinly woody, smooth. **Seeds** ecarunculate, subglobose; endosperm fleshy; cotyledons broad, flat, palminerved.

Monotypic trop. African genus: *Ricinodendron heudelotii* (Baill.) Pierre ex Heckel; sthn trop. Afr.: Angola, Mozambique. (See also *Schinziophyton*).

***Ricinus** L.

(Acalyphoideae—Acalypheae)

Burtt Davy *et al.*: 53 (1958); White: 203 (1962); Radcliffe-Smith: 322 (1987); Webster: 84 (1994); Radcliffe-Smith: 156 (1996); Radcliffe-Smith: 201 (2001); Coates Palgrave: 512 (2002); Phiri (Unpublished).

Monotypic genus: **Ricinus communis* L.; widely cultivated throughout sthn trop. Afr., and often naturalised. Also present in sthn Afr.

Schinziophyton Hutch. ex Radcl.-Sm.

(Crotonoideae—Ricinodendreae)

Radcliffe-Smith: 157 (1990); Webster: 113 (1994); Radcliffe-Smith: 328 (2001); Coates Palgrave: 515 (2002); Graz: 19 (2002).

Ricinodendron Müll.Arg. in part; Burtt Davy *et al.*: 53 (1958); White: 203 (1962).

Monotypic trop. African genus: *Schinziophyton rautanenii* (Schinz) Radcl.-Sm.; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sclerocroton Hochst.

(Euphorbioideae—Hippomaneae)

Hochstetter: 85 (1845); Esser: 378 (2001b).

Sapium Jacq. in part, as to some African species; Léonard: 151 (1962); Radcliffe-Smith: 324 (1996).

Monoecious subshrubs, shrubs or trees, glabrous; latex white. **Leaves** alternate; petiolate, eglandular; blades simple, shallowly serrate to entire, often with 1 or 2 marginal glands;

stipules linear, soon deciduous. **Inflorescences** terminal, leaf-opposed or sometimes axillary, solitary, spicate or racemiform, all male or with 1(2) female flowers at base; male bracts broad, 3–many-flowered, with 1 to several pairs of disc- to cup-shaped glands. **Male flowers**: pedicel jointed; calyx lobes 3(4); petals 0; stamens 2 or 3, free, very short. **Female flowers**: pedicels long; calyx lobes 3(4); petals 0; ovary 3-lobed, each lobe with 2 appendages; styles 3. **Fruit** 3-lobed, septicidally dehiscent into 3 bivalved cocci, each valve with an appendix. **Seeds** ovoid-ellipsoid, smooth, pale grey, without caruncle.

Species 6, trop. to sthn Afr. and Madagascar; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Shirakiopsis Esser

(Euphorbioideae—Hippomaneae)

Esser: 184 (1999); Esser: 1017 (2001a); Esser 380 (2001b).

Sapium Jacq. in part, as to some African species; Léonard: 151 (1962); Radcliffe-Smith: 324 (1996).

Monoecious trees or shrubs with multicellular, unbranched, usually coloured hairs; latex white. **Leaves** alternate; petioles short, eglandular; blades simple, shallowly serrate, penninerved, with a row of marginal glands below, lower surface paler than upper; stipules small, undivided, eglandular. **Inflorescences** terminal, solitary, spicate or racemiform; bracts with a pair of spheroidal glands, (0)1–3 basal ones with 1 female flower, many apical ones with (3)5–7 male flowers. **Male flowers** pedicellate; calyx lobes 2 or 3, unequal; stamens 2 or 3, free. **Female flowers** pedicellate; calyx lobes 2 or 3, subequal, connate only at base, eglandular; petals and disc 0; ovary2(3, 4)-lobed; styles 2(3, 4), connate at base, subpersistent. **Fruit** 2(3, 4)-lobed, rarely by abortion 1-coccous, laterally compressed, smooth, shiny, ± drupaceous, indehiscent or subindehiscent; mesocarp fleshy; endocarp thinly crustaceous. **Seeds** subglobose, smooth, pale, greyish brown, ecarunculate.

Species 6, 3 in Asia, 3 in Africa; sthn trop. Afr. 1: *Shirakiopsis elliptica* (Hochst.) Esser (= *Sapium ellipticum* (Hochst.) Pax; *Sapium mannianum* (Müll.Arg.) Benth.), Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Spirostachys Sond.

(Euphorbioideae—Hippomaneae)

Webster: 121 (1994); Radcliffe-Smith: 313 (1996); Radcliffe-Smith: 362 (2001); Coates Palgrave: 519 (2002).

Sthn trop. Afr. 1: *Spirostachys africana* Sond., Angola, Zimbabwe, Mozambique, and sthn Afr.

Spondianthus Engl.

(Phyllanthoideae—Antidesmeae)

Radcliffe-Smith: 104 (1987); Léonard & Nkounkou: 133 (1989a); Léonard & Nkounkou (1989b); Webster: 49 (1994); Léonard: 40 (1995b); Radcliffe-Smith: 56 (2001).

Dioecious trees, glabrous or with simple indumentum. **Leaves** simple or subverticillate, often crowded at shoot apices, petiolate, simple, entire, penninerved, varying greatly in size; stipules triangular-lanceolate, readily caducous. **Inflorescences** terminal or in axils of uppermost leaves, paniculate, solitary; males several-flowered, females 1-flowered; bracts resembling stipules. **Male flowers** subsessile; sepals (4)5, imbricate; petals (4)5, somewhat smaller than sepals; disc glands 5, epipetalous; stamens 5, episepalous, alternating with disc glands, filaments free, anthers introrse, medifixed, connective apically pigmented and glandular, thecae parallel, longitudinally dehiscent; pistillode obconic-cylindric, truncate and slightly trilobate at apex. **Female flowers** shortly pedicellate; sepals and petals ± as in male flowers or petals 0; disc shallowly cupular, 5-lobed, lobes alternating with sepals; ovary 3-locular, with 2 ovules per locule; styles 3, ± free, short, shortly bilobed, papillose. **Fruit** ± ellipsoid, loculicidally dehiscent into 3 valves; exocarp crustaceous; endocarp thin, horny; columella persistent, tripartite. **Seeds** 1 per locule by abortion, compressed ovoid-ellipsoid, often remaining attached to columella after dehiscence, shiny; exotesta papyraceous, reddish brown; mesotesta spongiose or chartaceous, white; endotesta thin, crustaceous; endosperm scanty, forming thin strata; embryo straight; cotyledons broad, flat.

Monotypic genus: *Spondianthus preussii* Engl., trop. Africa; sthn trop. Afr.: Angola.

Suregada Roxb. ex Rottler

(Crotonoideae—Gelonieae)

Léonard: 124 (1962); Radcliffe-Smith: 376 (1987); Webster: 102 (1994); Radcliffe-Smith: 249 (1996); Radcliffe-Smith: 283 (2001); White *et al.*: 261 (2001); Coates Palgrave: 515 (2002); Mapaura & Timberlake: 165 (2002).

Gelonium Roxb. ex Willd.; Burtt Davy *et al.*: 51 (1958).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Synadenium Boiss.

(Euphorbioideae—Euphorbieae)

Leach: 47 (1983–84); Carter: 534 (1988); Webster: 129 (1994); Carter: 435 (2000); Carter & Leach: 434 (2001); Radcliffe-Smith: 417 (2001); Carter: 228 (2002); Coates Palgrave: 535 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tannodia Baill.

(Crotonoideae—Aleuritideae)

Baillon: 251 (1861); Radcliffe-Smith: 172 (1987); Webster: 115 (1994); Radcliffe-Smith: 306 (1996); Radcliffe-Smith: 338 (2001); Coates Palgrave: 499 (2002); Mapaura & Timberlake: 165 (2002).

Dioecious or polygamo-dioecious (with an occasional male flower on a female inflorescence) trees or shrubs; indumentum simple. **Leaves** alternate, petiolate, stipulate, simple, entire or subentire, palminerved. **Inflorescences** terminal, interruptedly racemose; bracts 1–several-flowered. **Male flowers**: pedicels jointed; calyx closed in bud, later splitting into 2–5 valvate lobes; petals 4 or 5, free, imbricate; disc glands 4 or 5, free, alternating with petals; stamens 6–14, connate at base into a short column, 2-seriate with outer series short and opposite petals and inner longer and opposite sepals, anthers dorsifixed, outer ones introrse, inner ones extrorse, longitudinally dehiscent, connective broad; pistillode absent. **Female flowers**: pedicels jointed; sepals 4 or 5, ± free, ± equal, imbricate;

petals 4 or 5, larger than sepals, free, imbricate; disc shallowly cupular; ovary 3-locular, with 1 ovule per locule; styles 3, connate at base, bifid. **Fruits** trilobate-subglobose, dehiscing septicidally into 3 bivalved cocci; endocarp thinly woody. **Seeds** ecarunculate; testa crustaceous; endosperm fleshy; cotyledons broad, flat.

Species 4, 2 African and 2 from Madagascar and the Comoro Islands; sthn trop. Afr. 1: *Tannodia swynnertonii* (S.Moore) Prain, Zimbabwe, Mozambique.

Tetrorchidium Poepp.

(Crotonoideae—Adenoclineae)

Poeppig: 23 (1841); Léonard: 133 (1962); Radcliffe-Smith: 373 (1987); Webster: 101 (1994); Breteler: 97 (1999); Radcliffe-Smith: 278 (2001).

Hasskarlia Baill.; Hiern: 974 (1900).

Dioecious, completely glabrous shrubs, lianes or trees, exuding a milky sap. **Leaves** alternate or sometimes opposite on main axes, simple; petioles canaliculate, eglandular; blade obovate to elliptic, entire to shallowly crenate-serrate, penninerved. **Inflorescences** leaf-opposed. **Male flowers** in simple, dense spikes; bracts eglandular; calyx lobes 3, hyaline, each with 4 unequal concavities within; petals 0; disc 0; stamens 3(4), opposite calyx lobes, free; filaments very short; anthers erect, basifixed, 4-thecous, introrse, longitudinally dehiscent; pistillode minute, ± columnar. **Female flowers** in 3–5-flowered umbels; bracts soon falling; sepals 3, triangular-ovate; petals 0; disc glands 3, petaloid, alternating with sepals and carpels; ovary (2)3-locular, subglobose, with 1 ovule per locule; styles (2)3 adpressed to top of ovary. **Fruit** (2)3-locular and -lobed, dehiscing loculicidally or septicidally; columella slender. **Seeds** compressed-ellipsoid, sarcotesta orange-red, endotesta foveolate, black.

Species ± 20, mostly tropical America but 5 in trop. Africa; sthn trop. Afr. 1: *Tetrorchidium didymostemon* (Baill.) Pax & K.Hoffm., Angola.

Thecacoris A.Juss.

(Phyllanthoideae—Antidesmeae)

Jussieu: 12 (1824); Hiern: 967 (1900); Radcliffe-Smith: 107 (1987); Webster: 52 (1994); Léonard: 26 (1995a); Léonard: 82 (1995b); Radcliffe-Smith: 110 (1996); Radcliffe-Smith: 67 (2001).

Cyathogyne Müll.Arg.: 536 (1864a); Radcliffe-Smith: 110 (1987); Léonard: 43 (1995a).

Dioecious, rarely monoecious trees, shrubs or perennial herbs; indumentum simple. **Leaves** alternate or subfasciculate, shortly petiolate, stipulate, simple, entire or subentire, penninerved. **Inflorescences** axillary, solitary, geminate or fasciculate, pedunculate, spicate, racemose or rarely paniculate, few- to many-flowered; flowers 1 per bract. **Male flowers**: sepals 5(6), imbricate; petals 5, small, or absent; disc glands 5, free, interstaminal, alternating with sepals, thick; stamens 5, opposite sepals, filaments free, anther thecae distinct, introrse, parallel and pendulous at first, later extrorse, divaricate and erect, longitudinally dehiscent; pistillode large, obconic, turbinate or cyathiform, truncate and entire or 3–5-lobed. **Female flowers**: pedicels patent, elongating and deflexing in fruit; sepals somewhat connate at base, otherwise ± as in male; petals smaller than in male, or absent; staminodes sometimes present; disc hypogynous, annular, sometimes crenulate; ovary 3-locular, ovules 2 per locule; styles 3, free or connate at base, recurved, bifid; stigmas ± smooth. **Fruit** 3-lobed, dehiscent into bivalved cocci; pericarp thin, separating from the thinly woody endocarp; columella persistent. **Seeds** ovoid-subglobose to obovoid-pyriform, carunculate; testa thin, striate, shiny; endosperm copious, fleshy; cotyledons greenish.

Species 25, trop. Africa and Madagascar; sthn trop. Afr. 3, Angola, Zambia, Mozambique.

Tragia L.

(Acalyphoideae—Plukenetieae)

Hiern: 984 (1900); Radcliffe-Smith: 291 (1987); Webster: 95 (1994); Radcliffe-Smith: 216 (1996); Radcliffe-Smith: 253 (2001); Bingham & Smith: 141 (2002).

Sthn trop. Afr. 31, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tragiella Pax & K.Hoffm.

(Acalyphoideae—Plukenetieae)

Radcliffe-Smith: 318 (1987); Webster: 94 (1994); Radcliffe-Smith: 212 (1996); Radcliffe-Smith: 252 (2001); White *et al.*: 261 (2001); Bingham & Smith: 141 (2002).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Uapaca Baill.

(Phyllanthoideae—Antidesmeae)

Baillon: 595 (1858); Hiern: 963 (1900); Hutchinson: 634 (1912); Radcliffe-Smith: 566 (1988); Webster: 49 (1994); Radcliffe-Smith: 93 (1996); Radcliffe-Smith: 57 (2001); White *et al.*: 263 (2001); Coates Palgrave: 484 (2002).

Dioecious trees or shrubs; indumentum simple and/or minutely pseudolepidote; trunks occasionally stilt-rooted; twigs stout, often with pronounced leaf scars, producing an exudate, when cut, which hardens and darkens on drying. **Leaves** alternate, usually crowded towards end of twigs, petiolate or subsessile, stipulate or not; blades simple, often obovate, entire, penninerved. **Inflorescences** axillary, or borne on older wood, solitary or fasciculate, pedunculate, with a whorl of 5–12 involucrate imbricate tepaloid bracts surrounding flowers; male inflorescences many-flowered, flowers in dense globose capitula; female inflorescences 1-flowered. **Male flowers** sessile; calyx campanulate or turbinate, truncate, dentate or irregularly or regularly lobed, lobes imbricate; petals absent; disc absent; stamens (4)5(6), free, episepalous, anthers erect, subbasifixed, introrse, thecae parallel, longitudinally dehiscent; pistillode cylindric-obconic, infundibuliform, hypocrateriform, pileiform or sometimes lobed. **Female flowers** sessile; calyx minute, truncate, sinuate or lobed, disciform; petals absent; disc absent; ovary (2)3(5)-locular, with 2 ovules per locule; styles (2)3(5), free, thick, recurved, covering ovary, multipartite to laciniate. **Fruit** drupaceous, indehiscent; mesocarp spongy; pyrenes (2)3(4), dorsally carinate and bisulcate, indurate, tardily bivalved. **Seeds** mostly 1 per pyrene, compressed, ecarunculate; endosperm fleshy; embryo straight; cotyledons broad, flat, green.

Species 61, 49 restricted to trop. Africa, the rest endemic to Madagascar; sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

*Vernicia Lour.

(Crotonoideae—Aleuritideae)

Radcliffe-Smith: 178 (1987); Webster: 114 (1994); Radcliffe-Smith: 301 (1996); Radcliffe-Smith: 331 (2001).

Sthn trop. Afr. 2, cultivated throughout the region and may become naturalised. Also present in sthn Afr.

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Fabaceae
(Leguminosae)
(Rosidae—Fabales)
(Eurosids I—Fabales)

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The classification reflected in this account follows very largely that of Polhill & Raven (1981).

The keys are based on the following publications: Polhill & Raven (1981); Polhill (1981); Schrire (1995); *Flora of tropical east Africa:* Leguminosae, *Flora zambesiaca* 3, and Germishuizen (2000).

Sthn trop. Afr.: genera 110, species 1200.

Key to subfamilies

1a Flowers regular; petals valvate in bud, often united at the base; sepals usually united at the base; stamens as many as petals or twice as many or many, free or all united into a tube or to the base of the petals; anthers uniform, dehiscing lengthwise, sometimes with a deciduous gland at the apex; leaves bipinnate or, rarely, pinnate in indigenous species; seeds usually with an areole on each face or side ..... **Mimosoideae** (below)

1b Flowers nearly always irregular; petals imbricate in bud, free or some of them united; seeds usually without an areole:

2a Adaxial (uppermost) petal overlapped on each side by the adjacent lateral petals (when present); sepals often free; stamens 10 or fewer, free or less often variously united; anthers uniform, rarely dimorphic, dehiscing lengthwise or by terminal pores; leaves mostly pinnate or bipinnate, rarely simple or 1-foliolate; seeds with radicle usually straight ..... **Caesalpinioideae** (p. 173)

2b Adaxial petal outside the adjacent lateral petals ("wings") and usually forming with the keel petals an irregular corolla; sepals united at the base; stamens 10 or rarely fewer, rarely free, most often the adaxial ones free or nearly so and the other 9 united, sometimes united into 2 groups of 5 or all united; anthers mostly dehiscing lengthwise; seeds with radicle usually curved ..... **Papilionoideae** (p. 176)

Subfamily **Mimosoideae** (Mimosaceae)

Key to genera

1a Plant armed with prickles or spines:

2a Inflorescence 2-coloured, the upper part bisexual, yellow, the lower part neuter, mauve, pink or white; short lateral branches ending in spines, plant otherwise unarmed ..... **Dichrostachys**

2b Inflorescence 1-coloured; plant armed with recurved prickles or stipular spines, very rarely with short lateral branchlets ending in spines:

3a Plant without recurved prickles and stipular spines; spine-tipped lateral shoots are present; inflorescence globose; stamen filaments united basally into a tube ..... **Albizia**

3b Plant armed with recurved prickles or stipular spines; spine-tipped branchlets absent:

4a Flowers in globose or subglobose heads, rarely the inflorescence reduced to only 2–4 flowers per "head":

5a Stamens many (± 35–200); flowers white, yellowish white or pale to deep yellow ..... **Acacia**

5b Stamens as many as or twice as many as the (3)4, 5(6) corolla lobes; flowers pink or mauve ..... **Mimosa**

4b Flowers in spikes or spiciform racemes:

6a Stamens many (± 35–200):

7a Petioles glandular; stamen filaments free; pods mostly dehiscent, various ..... **Acacia**

7b Petioles eglandular; stamen filaments shortly connate basally; pods indehiscent, falcate or spirally coiled ..... **Faidherbia**

6b Stamens 10:

8a Recurved prickles scattered along the stem; pods compressed, slightly curved to falcate, at maturity the valves splitting transversely into 1-seeded segments ..... **Adenopodia**

8b Straight stipular paired spines present; pods slightly curved or coiled, indehiscent, not segmented ..... ***Prosopis**

1b Plant unarmed:

9a Inflorescence capitate, globose or subglobose:

10a Aquatic herb with creeping, usually floating and swollen stems; flowers of 2 sorts: bisexual in upper part of head, sterile with elongate staminodes in lower part ..... **Neptunia**

10b Tree, shrub or suffrutex, rarely herbaceous, but then not aquatic:

11a Leaves reduced to simple, entire phyllodes ..... ***Acacia** (exotic species)

11b Leaves 2-pinnate:

12a Stamens many (± 20–200):

13a Stamen filaments free; central flower of inflorescence not different from the rest ..... **Acacia**

13b Stamen filaments united basally into a tube, tube included or exserted beyond the corolla; central flower of inflorescence usually differing from and often larger than the rest ..... **Albizia**

12b Stamens less than 15:

14a Leaves with 1 pair of pinnae; leaflets large, 20–60 mm wide; tree up to 15 m high ..... **Xylia**

14b Leaves with (2)3–10 pairs of pinnae; leaflets smaller than above; perennial herb, suffrutex, shrub or tree:

15a Anthers with conspicuous scattered hairs; flowers in heads up to 18 mm in diameter; shrub or small tree with densely grey-puberulous branchlets; leaflets 1.5–4.0 mm wide ..... ***Leucaena**

15b Anthers glabrous:

16a Perennial herb or suffrutex; flowers in globose heads ..... ***Desmanthus**
16b Tree; flowers in heads with a globose apical part narrowing into a short cylindric neck ..... **Parkia**
9b Inflorescence elongate, spicate or racemose:
17a Stamens 5; staminodes 5 ..... **Pentaclethra**
17b Stamens 10(12) or many:
18a Stamens many (±20–200) ..... **Acacia**
18b Stamens 10(12):
19a Leaflets alternate to subopposite:
20a Flowers with a thick disc in the base of the calyx; pinnae in 1 or 2 pairs with 2–4 pairs of leaflets per pinna ..... **Fillaeopsis**
20b Flowers with disc inconspicuous or absent; pinnae in 2–7 pairs with 6 to many pairs of leaflets:
21a Anthers without a gland at the apex of the anthers, even in bud; pinnae with many pairs of leaflets ..... **Amblygonocarpus**
21b Anthers with a gland at the apex of the anthers; pinnae with 6–12 pairs of leaflets ..... **Tetrapleura**
19b Leaflets opposite, very rarely alternate, but then sessile and less than 2 mm wide:
22a Leaf rachis with a gland at the junction of each pair of pinnae or of the upper pairs; large tree ..... **Newtonia**
22b Leaf rachis without glands as above:
23a Very tall forest tree up to 50 m high with buttressed base ..... **Piptadeniastrum**
23b Shrub, liane or small tree without buttresses, growing in woodland not in forest:
24a Leaf with a single pair of pinnae ..... **Calpocalyx**
24b Leaf with (1)2–20 pairs of pinnae:
25a Petals ± puberulous to pubescent outside; ovary hairy ..... **Pseudoprosopis**
25b Petals glabrous outside; ovary glabrous:
26a Subshrub, shrub or small tree; pod indehiscent ..... **Elephantorrhiza**
26b Liane, climber or erect suffrutex; pod splitting transversely into segments each containing a seed ..... **Entada**

Subfamily **Caesalpinioideae** (Caesalpiniaceae)

Key to genera

1a Leaves simple, emarginate apically to deeply bilobed, or consisting of a single pair of leaflets:
2a Petals 0:
3a Stamens (8)10(12); inflorescence an axillary or terminal panicle; leaves with 3–6 conspicuous nerves arising from the base; pods pale yellowish brown, reniform, indehiscent; seeds with small reddish sticky resin glands ..... **Colophospermum**
3b Stamens 20–25; inflorescence a slender raceme or panicle; leaflets with 7–12 prominent nerves arising from the base; pods brown or reddish brown, obliquely semiorbicular, ovate or ovate-oblong, dehiscent or indehiscent; seeds not as above ..... **Guibourtia**
2b Petals 5:
4a Leaves simple, entire, 3-veined from the base ..... **Griffonia**
4b Leaves emarginate apically to deeply bilobed, or with a single pair of leaflets:
5a Leaves emarginate apically to deeply bilobed:
6a Plant with trailing or climbing, mostly herbaceous stems arising from a large underground tuber; tendrils usually present; fertile stamens 2, accompanied by staminodes; calyx with 2 upper sepals partly or completely fused, the rest free ..... **Tylosema**
6b Shrub or small tree, seldom scandent or climbing, but then woody and without tendrils:
7a Flowers normally unisexual and plant dioecious; female flowers with the stigma sessile on the ovary, capitate, flattened-globose; male flowers with 10 fertile stamens; calyx turbinate with 4 or 5 short broad lobes ..... **Piliostigma**
7b Flowers bisexual; style elongate; fertile stamens 1–10; calyx spathaceous or campanulate with 5 short lobes or teeth:
8a Calyx spathaceous, splitting to the base down one side only, with the sepals fused or sometimes partly separated; fertile stamens 1–10, sometimes accompanied by staminodes; pods oblong or oblanceolate-oblong, valves thinly woody ..... **Bauhinia**
8b Calyx campanulate, with 5 short teeth or lobes; fertile stamens 10; plant often conspicuously glandular; pods semiorbicular, valves papery, with or without stalked glands ..... **Adenolobus**
5b Leaves unijugate: with a single pair of leaflets:
9a Sepals 4, imbricate; leaves with many pellucid dots; stamens all free; seeds hard ..... **Hymenaea**
9b Sepals 5, slightly to considerably reduced; leaves without pellucid dots; 9 of the 10 stamens united at the base; seeds with a very thin membranous testa ..... **Tetraberlinia**
1b Leaves pinnately or bipinnately compound; leaflets more than 2:
10a Leaves bipinnate:
11a Plant armed with prickles or spines:
12a Calyx lobes valvate; flowers small, greenish to white; spines usually branched ..... ***Gleditsia**
12b Calyx lobes or teeth imbricate; flowers yellow, pale yellowish white, pink, red or magenta; spines not branched:
13a Petals 2–3 mm long; pods samaroid, with a basal seed-containing portion of which the upper suture is greatly extended beyond the seed-containing part and is broadly winged on its lower side ..... **Pterolobium**
13b Petals 6–25 mm long; pods not winged:
14a Leaf rachis up to ± 0.4 m long, flattened, bearing along its margin very small, rather sparse, mostly alternate leaflets ..... ***Parkinsonia (aculeata)**
14b Leaves not as above; leaflets mostly opposite ..... **Caesalpinia**
11b Plant unarmed:

15a Leaflets alternate; flowers small (petals 2–5 mm long, white to cream-coloured or pale green); sepals open from a very early stage, leaving the petals covering the flower until anthesis:
16a Flowers pedicellate; petals narrow, ± densely pubescent, at least on the margins; anthers 0.5–0.75 mm long; stigma small, hollow, on a narrow conical style; stamen filaments pubescent or tomentose to near the apex; hairs (when present) on vegetative buds and young branchlets grey-brown to yellowish ..... **Erythrophleum**
16b Flowers sessile; petals glabrous or almost so; anthers 1.5–2.0 mm long; style very short, ending in a funnel-shaped stigma slit down one side; stamen filaments glabrous; hairs on vegetative buds, young branches and inflorescence axes rusty red ..... **Burkea**
15b Leaflets opposite; flowers usually medium to large (petals 7–32 mm long, seldom smaller, yellow, orange, red or magenta); sepals valvate or imbricate:
17a Leaves imparipinnate; herb or low shrub up to 0.5 m high; stems, leaves and calyces with many dark sessile glands; petals up to 9 mm long ..... **Hoffmannseggia**
17b Leaves paripinnate; tree or large shrub; petals 7–32 mm long:
18a Stigma not broadly peltate; inflorescence axis, calyx and ovary not rusty tomentose; petals yellow, pink, red or magenta; stipules not as below ..... **Caesalpinia**
18b Stigma broadly peltate; inflorescence axis, calyx and ovary rusty tomentose; petals yellow; stipules up to 14 mm long, linear-subulate with up to 7 linear, alternate lateral appendages up to 6 mm long:
19a Leaflets mostly more than 10 pairs per pinna; pod indehiscent, flattened, winged along both sutures ..... **Peltophorum**
19b Leaflets mostly fewer then 10 pairs per pinna; pod dehiscent, not winged, elastically dehiscing into 2 recurving, narrow woody valves ..... **Bussea**

10b Leaves once-pinnate:
20a Plant armed with spines:
21a Leaves with 3 pairs of opposite leaflets; inflorescence a relatively few-flowered lateral or terminal raceme; petals yellow, 8–10 x 5–7 mm; ovary glandular ..... **Haematoxylum**
21b Leaves with (3–)5–10(–12) pairs of irregularly alternate leaflets; inflorescence a dense drooping raceme; petals white; ovary eglandular .... ***Gleditsia**
20b Plant unarmed:
22a Bracteoles paired, valvate throughout, well-developed, completely enclosing the flower bud, usually persistent:
23a Leaflets alternate, mostly 2–6:
24a Perianth of 4 sepals and 5 subequal petals ..... **Oddoniodendron**
24b Perianth of (1) or 2 minute tepals ..... **Librevillea**
23b Leaflets opposite, in 2 to many pairs:
25a Filaments of stamens and staminodes all fused ± halfway into a pubescent tube ..... **Tamarindus**
25b Filaments of stamens and staminodes (if present) free or only some fused at base:
26a Stamens 10(–14), all fertile and subequal:
27a Perianth 0 or of (1)4–7(–11) parts, all sepaloid and of similar form, grading inwards from broader to narrower ... **Brachystegia**
27b Perianth clearly differentiated into sepals and petals:
28a Petals 5(6), subequal; stamens 10, all free or with filaments of 9 shortly connate at the base:
29a Leaflets distinctly petiolulate; petiolules not twisted; stamens 10(–14) with all filaments free ..... **Isoberlinia**
29b Leaflets subsessile to sessile; petiolules usually twisted; stamens 10, with filaments of 9 connate at the base .... **Julbernardia**
28b Petals 5 but 1 much larger than the others; stamens 10, with filaments of 9 connate at the base:
30a Leaflets distinctly petiolulate ..... **Berlinia**
30b Leaflets sessile or subsessile:
31a Sepals 0 or up to 5 but usually much reduced; leaflets with distal half much reduced to ± absent ..... **Aphanocalyx**
31b Sepals 5; leaflets with both halves ± equal ..... **Isoberlinia**
26b Stamens 3–9, very unequal, usually not more than 3 fertile, the rest smaller and often staminodial:
32a Sepals minute or absent; bracteoles petaloid, white or pink ..... **Cryptosepalum**
32b Sepals well-developed, mostly 4; bracteoles not petaloid:
33a Large stamens (usually 3, sometimes more) in an outer whorl, the others much reduced, inserted on a short intrastaminal tube; leaflets with specialised glands on the margin; fruits with 1–3 longitudinal nerves ..... **Gilbertiodendron**
33b Stamens essentially in a single whorl; no intrastaminal tube; leaves without specialised glands around the edges; fruits transversely veined:
34a Flowers large, in dense subcorymbose terminal panicles; bracteoles 25–37 mm; petals 5, of three different lengths; seeds areolate; petiolules twisted, short, the leaflets very unequal-sided at the base ..... **Paramacrolobium**
34b Flowers more laxly arranged in racemes or extended panicles; bracteoles shorter; petals 2–6, equally long or some small; seeds not areolate; petiolules rarely twisted ..... **Anthonotha**
22b Bracteoles not valvate, often scale-like, often caducous or 0, seldom enclosing the flower bud, but if so then one or both margins of one bracteole overlapping the other, at least at the base, and the flower with only 1 petal:
35a Anthers opening by terminal or basal pores or short subapical subvertical slits, usually basifixed; petals mostly yellow; glands often present on petiole or leaf rachis:
36a Leaves imparipinnate; sepals 4; stamens coherent either by the filaments or the anthers, or by both, to form a hood-like synandrium; flowers resembling an orchid; petals bright pink with brown lines ..... **Duparquetia**

36b Leaves paripinnate; sepals 5; stamens not coherent to form a synandrium; petals mostly yellow:
37a Filaments of the 3 adaxial stamens sigmoidally incurved, many times longer than their small anther; filaments of other stamens straight, shorter, the anthers dehiscing by basal pores; pedicels 2-bracteolate at or just above their base; pod elongate, usually cylindric, indehiscent; seed coat smooth, without areoles ..... **Cassia**
37b Filaments of all stamens straight, either shorter or not more than twice as long as their anthers; if longer, then the anthers dehiscing by apical pores; pods various, but if cylindric and indehiscent then the pedicels without bracts:
38a Braeteoles 0; pod either indehiscent, or breaking inelastically through one or both sutures; if through both, then the valves not coiling; androecium often irregular, the members tending to decrease in size from the abaxial to the adaxial side of the flower; anther thecae naked along the sutures; seed coat often with a closed areole on each face or margin; tree, shrub or herb ..... **Senna**
38b Bracteoles 2; pod elastieally dehiscent, the valves coiling at or after dehiscence; androecium ± regular, members of the two sides sometimes of different lengths but not decreasing regularly from the abadxial to the adaxial side of the flower; anther theeae ciliolate along the sutures; seed coat without areoles; usually a herb ..... **Chamaecrista**
35b Anthers opening by longitudinal slits as long as the anther, usually dorsifixed; conspicuous glands not present on petiole or rachis:
39a Petals 0 or sometimes petals present but then petals shorter than sepals and arising from beneath the margin of a pronounced hypogynous disc, or petals reduced to minute, linear, inconspicuous filaments and apparently absent:
40a Petals 0, 1(–5), if present then no longer than ± 2 mm and arising from beneath the margin of a pronounced hypogynous disc; anthers basifixed; pod drupaceous, globose to discoid with 1 or 2 seeds ..... **Dialium**
40b Petals 0, no reduced or modified petals present; anthers dorsifixed:
41a Sepals 1 or 0; stamens 6–8 with all filaments shortly connate at the base ..... **Icuria**
41b Sepals 4–6; stamens various but not all filaments connate at the base:
42a Leaflets with translucent gland dots:
43a Sepals 5(6); leaflets mostly alternate, but first and last pair sometimes subopposite ..... **Oxystigma**
43b Sepals 4(5); leaflets alternate or opposite:
44a Leaves with 1 pair of opposite leaflets ..... **Guibourtia**
44b Leaves with more than 2 leaflets which are alternate to subopposite:
45a Ovule/seed 1 per ovary/fruit; anther filaments hairy towards base; fruit resembling a samara ..... **Gossweilerodendron**
45b Ovules 2(–4) per ovary; seed 1, partly enclosed in a coloured arillus; fruit dehiscing into 2 valves . **Copaifera**
42b Leaflets without translucent gland dots:
46a Leaflets alternate, with twisted petiolules; flowers on long slender pedicels arranged in lax racemes; ovary densely tomentose ..... **Crudia**
46b Leaflets mostly opposite, petiolules not twisted; flowers on short stout pedicels arranged in short panicles or racemes; ovary glabrous ..... **Schotia**
39b Petals 1–5, some of which may be much reduced:
47a Petals 5, ± equal:
48a Flowers arranged in 2 rows (distichously) along the inflorescence axes; leaflets mostly alternate:
49a Leaflets usually without any translucent gland dots but with a small ± marked swelling near the posterior margin of each leaflet close to the base; petals mostly longer than 50 mm ..... **Baikiaea**
49b Leaflets with numerous translucent gland dots, but without any marginal swelling near the base; petals shorter than 30 mm:
50a Leaflets usually emarginate at the apex; stamens 10: 1 free, 9 with filaments connate at the base ..... **Tessmannia**
50b Leaflets not or only vaguely emarginate at the apex; stamens 10, all free ..... **Gilletiodendron**
48b Flowers arranged spirally in more than 2 rows along the inflorescence axes; leaflets opposite or alternate:
51a Stipe of ovary free, arising at bottom of receptacle; leaflets opposite ..... **Cynometra**
51b Stipe of ovary fused to the wall of the receptacle; leaflets opposite or alternate:
52a Portion of stipe included in the receptacle and completely fused with the receptacle wall; ovules many (rarely 2); leaflets opposite, subsessile ..... **Normandiodendron**
52b Portion of stipe included in the receptacle only partially fused with the wall of the receptacle:
53a Leaflets mostly alternate, subsessile; receptacle elongate, narrowly obconical; tree emitting a strong garlic odour . ..... **Scorodophloeus**
53b Leaflets mostly opposite or subopposite with some gland dots underneath; receptacle very short, cup-shaped; tree without garlic odour ..... **Brenaniodendron**
47b Petals 1–5; if 5 then very different:
54a Petiolules twisted; fertile stamens 7 ..... **Afzelia**
54b Petiolules not twisted; fertile stamens 10 or more:
55a Leaflets usually with translucent gland dots; upper surface of leaf rachis with 2 very small glandular openings at the level of the petiolules; ovules many; seed with a small arillus ..... **Daniellia**
55b Leaflets without translucent gland dots; leaf rachis without glandular openings; ovules 2(3); seed without arillus ..... **Hymenostegia**

Subfamily **Papilionoideae** (Papilionaceae)

Key to tribes

1a Filaments all free from base upwards, occasionally shortly and ± equally connate at base only; anthers usually uniform in size and shape:
2a Calyx entire in bud; stamens 9–many; petals 0–9, not much differentiated ..... **Swartzieae** (p. 179)
2b Calyx lobes apparent or corolla markedly papilionoid; stamens (5–)10(–30); petals generally 5; leaves pinnately foliolate or of only 1 leaflet ..... **Sophoreae** (p. 179)
1b Filaments partly or almost wholly united to one another, either monadelphous in a closed tube, or diadelphous with the vexillary (adaxial) filament often free or partly so:
3a Anthers distinctly of 2 forms: alternately long and basifixed, and shorter and dorsifixed; leaves simple, 1-foliolate or digitately 3(–many)-foliolate, if compound, leaves generally pulvinate or with a raised leaf base, rarely distichous, never glandular-punctate; fruit never jointed:
4a Filaments fused into a sheath open on upper side ..... **Crotalarieae** (p. 177)
4b Filaments fused into a closed tube ..... **Genisteae** (p. 178)
3b Anthers ± uniform, at least in size, some sometimes aborted, or if of 2 forms (in Aeschynomeneae, Psoraleeae and a few Phaseoleae, by abortion in *Teramnus*) then leaves pinnate or glandular-punctate:
5a Leaves without pulvinus (stipules often adnate to petiole base) or reduced, often with a stipular ridge forming an abaxial commissure, generally distichous or crowded; inflorescence axillary; herb or small softly woody shrub:
6a Leaflets ± toothed; nerves extending to the ± toothed margin of the leaflets; stipules adnate to petiole base ..... **Trifolieae** (p. 179)
6b Leaves not toothed (except some Psoraleeae); nerves looped within the margin (except some Galegeae):
7a Leaves generally paripinnate, ending in a tendril or bristle, rarely imparipinnate; stipules free from petiole, generally foliaceous; fruit 2-valved; seeds lenticular to globose with ± linear hilum and no radicular lobes; herb ..... **Vicieae** (p. 179)
7b Leaves generally ending in a leaflet or a spine, less often in a bristle; stipules generally small and/or adnate to the petiole; seeds with a small round hilum generally below a radicular lobe:
8a Filaments of all or alternate stamens dilated apically; flowers 1 or 2 from axils, in heads or more often umbellate, sometimes subtended by a foliar bract; compound leaves generally with at least 3 terminal leaflets conjugate, lowermost pair sometimes stipule-like, sometimes with a glandular stipule:
9a Fruit not jointed, generally dehiscent if long-exserted ..... **Loteae** (p. 178)
9b Fruit jointed or elongated with thickened margins and hooked tip ..... **Coronilleae** (p. 177)
8b Filaments not dilated upwards:
10a Ovule 1; fruit 1-seeded, glandular; inflorescences compound, with more than 1 series of bracts; foliage ± glandular-punctate or pustulate ..... **Psoraleeae** (p. 178)
10b Ovules 2–many; fruit not both 1-seeded and glandular; racemes or fascicles simple with flower bracts only ..... **Galegeae** (p. 178)
5b Leaves pulvinate, mostly free from stipules, if present:
11a Petals 5, all similar, ribbon-like or spathulate; fruit drupaceous or flat and curved, eglandular 1(2)-seeded, indehiscent ..... **Dalbergieae** (p. 178)
11b Petals differentiated, papilionoid:
12a Stamens 9; leaves paripinnate; flowers in pseudoracemes (pedicels several at a rachis node) or axillary fascicles; pods elastically dehiscent, with brown to brightly coloured seeds ..... **Abreae** (p. 177)
12b Not as above:
13a Anthers apiculate or appendaged; petals usually reddish and caducous, 2-branched hairs present (often among others); normally leafy ..... **Indigofereae** (p.178)
13b Anthers not appendaged (if petals caducous):
14a Fruit 1-seeded, often nutlet-like, small, generally glandular, with marcescent calyx; foliage glandular-pustulate or -punctate; never twining or large tree; inflorescence axillary; leaves (1–)3(–5)-foliolate ..... **Psoraleeae** (p. 178)
14b Fruit more pod-like, eglandular or woody; glands, if present, generally on surface or small internal dots:
15a Fruit transversely jointed, sometimes of only 1 article, or less often opening down 1 suture (then tertiary venation of leaflets scalariform); seeds with radicular lobe longer than cotyledonary lobe; lower petals generally withering and caducous after explosive pollen release; inflorescence generally compound with more than 1 series of bracts; leaves pinnately 3(–11)-foliolate, generally stipellate; stipules and bracts often striately nerved ..... **Desmodieae** (p. 178)
15b Fruit not jointed, or if so (Aeschynomeneae), seeds more symmetric; lower petals more retractible or little interconnected and differentiated:
16a Style straight or curved away from standard; standard with a median gutter; leaves digitately 3-foliolate ..... **Crotalarieae** (p. 177)
16b Style curved towards standard:
17a Hypanthium 0; intrastaminal disc generally present; vexillary filament often connate medially, but free, arched and thickened to form openings at base; flowers generally in pseudoracemes, sometimes in extensive panicles or clustered in axils; leaves generally imparipinnate, 3–many-foliolate, leaflets generally strictly opposite and stipellate, occasionally alternate, sometimes 1-foliolate or simple:
18a Leaves 1–many-foliolate, if 3-foliolate the lateral leaflets only slightly asymmetric; tree, shrub or liane with hard wood, less often a subshrub or herb (*Tephrosia* species generally have closely parallel nerves extending to leaflet margins, but easily confused with Phaseoleae subtribe Ophrestiinae); inflorescences aggregated towards branch ends ..... (=Tephrosieae) **Millettieae** (p. 179)
18b Leaves (1–)3-foliolate, the laterals usually markedly asymmetric and regularly stipellate, occasionally 5–9-

foliolate; twining, prostrate or erect herb, sometimes a shrub, liane or tree; inflorescences often in many axils .... **Phaseoleae** (p. 180)

17b Hypanthium present, short to long, intrastaminal disc generally lacking; vexillary filament not flared at base of staminal tube; flowers almost always arising singly if inflorescence is extended; leaves variously paripinnate to imparipinnate; leaflets alternate to opposite, with or without stipels, sometimes 1–3-foliolate:

19a Fruit jointed or geocarpic .... **Aeschynomeneae** (below)

19b Fruit neither jointed nor geocarpic:

20a Ovules 1–4; fruit indehiscent, the seeds generally in separate seed chambers with hard endocarp; keel petals generally overlapping abaxially or, if margins adnate, flowers usually secund on the rachis, ± free from wings; stamens often shortly and/or irregularly joined .... **Dalbergieae** (p. 178)

20b Ovules generally more than 4; fruit generally more pod-like, even if flat and indehiscent:

21a Flowers in axillary racemes (occasionally with 1 or 2 branches if on leafless shoots) or rarely strictly leaf-opposed or in axillary clusters; stamens three-quarters joined except some bird-flowers; keel petals abaxially joined (shortly in some bird-flowers); pods usually dehiscent, often septate internally .... **Robinieae** (p. 179)

21b Flowers in terminal panicles, sometimes with supplementary axillary racemes, rarely all axillary; stamens very rarely joined so high and keel petals usually overlapping abaxially; fruit generally indehiscent .... **Sophoreae** and **Millettieae** (=Tephrosieae) (p. 179)

Tribe **Abreae**

Only one genus in tribe .... **Abrus**

Tribe **Aeschynomeneae**

Key to genera

1a Leaflets digitately 2- or 4-foliolate (occasionally a few leaves with 3 leaflets), often glandular-punctate .... **Zornia**

1b Leaflets 3–many (sometimes in *Aeschynomene* undeveloped at flowering time), pinnate, the leaflets not all arising at the same point:

2a Leaves paripinnately 4-foliolate; fruits developing underground; receptacle (extended hypanthium) long and filiform and easily mistaken for a pedicel but flowers are actually sessile; cultivated for seeds (peanuts) but sometimes found as an escape .... ***Arachis**

2b Leaves not all 4-foliolate; fruits not developing underground (or if so, in *Aeschynomene nematopoda*, leaflets very narrow); receptacle not developed except in *Stylosanthes*:

3a Leaves pinnately 3-foliolate; calyx extended basally as a pedicel-like receptacle; fruits with 1 or 2 articles, the apical article narrowed into a distinct hooked beak .... **Stylosanthes**

3b Leaves paripinnate or imparipinnate with more than 3 leaflets; calyx not so extended; fruits rarely as above:

4a Calyx subequally 5-toothed; shrub with hard woody stems; articles of the fruit elliptic or oblong, veined, often bristly or papillate; leaves imparipinnate, the leaflets usually ± alternate .... **Ormocarpum**

4b Calyx 2-lipped or rarely 5-toothed but then tiny herbs; shrubs or herbs; articles rectangular or semicircular, less often elliptic; leaves usually paripinnate or rarely absent:

5a Fruit curved into a ring, the articles dehiscent, leaving the persistent sutures; annual herb .... **Cyclocarpa**

5b Fruit not as above, if curved then plant not an annual:

6a Inflorescence mostly lax; fruit straight, curved or rarely coiled, of 1–many articles, mostly well exserted from the calyx; bracts mostly small (except in sect. *Rubrofarinaceae*), not scarious and not masking the flowers and fruits; bracteoles often deciduous ... **Aeschynomene**

6b Inflorescence mostly dense and ± scorpioid, often strobilate; fruit not visible, enclosed within the calyx or bracts, folded like a concertina, of 1–9 articles:

7a Fruit not included in the calyx, of 1 or 2 articles; bracts membranous, larger than the flowers and hiding the fruit, persistent; bracteoles and calyx membranous .... **Humularia**

7b Fruit included in the calyx, of 2–9 articles; bracts scarious, smaller than the flowers; bracteoles and calyx scarious:

8a Stipules not spurred; leaflets alternate, with 2–7 basal nerves; inflorescence distichous, usually dense and strobilate; bracts persistent; lateral appendages of keel petals short or lacking .... **Kotschya**

8b Stipules spurred; leaflets opposite, with only one main nerve; inflorescence subumbellate; bracts deciduous; lateral appendages of keel petals nearly as long as the claws .... **Smithia**

Tribe **Coronilleae**

Only one genus represented .... **Antopetitia**

Tribe **Crotalarieae**

Key to genera

1a Style straight, directed forwards or downwards; anthers subequal in length:

2a Anthers elongate, 4 basifixed, 6 attached a little higher .... **Pearsonia**

2b Anthers all small, rounded, 10, 9 or 5:

3a Stamens 10, all fertile .... **Rothia**

3b Stamens 9, 4 lacking anthers .... **Robynsiophyton**

1b Style curved upwards; anthers unequal in length:

4a Upper part of style glabrous, usually not differentiated from the lower part, never coiled; anthers normally 4 + 6 (carinal one intermediate); pods usually flat to only slightly inflated ..... **Lotononis**

4b Upper part of style with 1 or 2 lines of hairs, rarely glabrous but then upper part clearly differentiated from the thicker lower part, or helically coiled; anthers 5 + 5; pods usually markedly inflated; keel beaked:

5a Beak of keel not helically coiled ..... **Crotalaria**

5b Beak of keel helically coiled through several turns ..... **Bolusia**

Tribe **Dalbergieae**

Key to genera

1a Anthers basifixed, with apical dehiscence; stamens often fused in 2 groups of 5; some branches often modified as spines or climbing aids . **Dalbergia**

1b Anthers dorsifixed, with longitudinal dehiscence; stamens monadelphous or the vexillar one free; branches unarmed or stipules spinescent:

2a Leaflets opposite or subopposite; pod strongly falcate to curved ..... **Machaerium**

2b Leaflets alternate; pod ± orbicular with a ± median seed ..... **Pterocarpus**

Tribe **Desmodieae**

Key to genera

1a Pod 2-valved, several-seeded, not breaking transversely into articles; leaflets, at least of upper leaves, 3 ..... **Pseudarthria**

1b Pod breaking transversely into articles:

2a Pod folded like an accordeon, almost completely included in the calyx; leaflets (1–)3–9, up to 80 mm long or more ..... **Uraria**

2b Pod not as above; leaflets 1 or 3:

3a Pod on a long plumose stipe; petiole winged; leaflet 1 ..... **Droogmansia**

3b Pod not on a long stipe; petiole not winged:

4a Calyx ± glumaceous; leaflet 1; pod subcylindric or somewhat flattened ..... **Alysicarpus**

4b Calyx not glumaceous; leaflets 1 or 3; pod flattened ..... **Desmodium**

Tribe **Galegeae**

Key to genera

Style bearded; pod membranous, often inflated, without a longitudinal septum ..... **Lessertia**

Style glabrous; pod completely or incompletely divided longitudinally into 2 locules by the introflexion of the carinal suture ..... **Astragalus**

Tribe **Genisteae**

Key to genera

Pods without glandular tubercles; lip formed by upper calyx lobes more than twice as long as the tube, as long as the lower lip ..... **Argyrolobium**

Pods with conspicuous glandular papillae; lip formed by the upper calyx lobes ± as long as the tube, shorter than the lower lip; leaves mostly crowded on short shoots ..... **Adenocarpus**

Tribe **Indigofereae**

Key to genera

1a Stamens free distally for ± 2 mm, sheath L-shaped, anthers without apiculate connective, tufted hairy above and below; style twisted, dilated medially or abruptly constricted at the base; keel prolonged-rostrate; endocarp without tannin deposits; leaves simple ..... **Rhynchotropis**

1b Stamens free distally for less than 1 mm, anthers with distinct apical connective; style tapering evenly to stigma:

2a Pods 3–5 mm wide, erect, stramineous, longitudinally ridged; leaflets often dentate; vexillary stamen lightly attached to the sheath; corolla darkly veined when dry; dorsal surface of standard glabrous; keel not prolonged-rostrate; endocarp without tannin deposits; leaves pinnate ..... **Cyamopsis**

2b Pods less than 3 mm wide, erect, patent or reflexed, not as above; leaflets never dentate; vexillar stamen free; corolla not darkly veined when dry:

3a Keel (and usually dorsal surface of standard) hairy; upper margin of the keel with a fringe of hairs; standard mostly broad at the base, tapering suddenly to a short claw; keel with lateral spurs, not prolonged-rostrate at the apex; endocarp tannins usually present ..... **Indigofera**

3b Keel (and usually dorsal surface of standard) glabrous; standard narrow at the base, tapering gradually to the claw; keel with lateral pockets (spurs absent), often prolonged-rostrate at the apex; endocarp without tannin deposits:

4a Style short, thick; stigma discoid; fruiting pedicels mostly over 2 mm long, ± patent; pods often held at ± a right angle; anthers, at least those of the 4 shorter stamens, with hyaline scales at the base; bracts persistent; inflorescences lax in bud ..... **Microcharis**

4b Style narrow, tapering to an oblique or capitate stigma; fruiting pedicels rarely over 2 mm long, reflexed (as are the pods); anthers of the shorter stamens mostly with scales reduced or absent; bracts caducous; inflorescences dense in bud ..... **Indigastrum**

Tribe **Loteae**

Only one genus represented ..... **Lotus**

Tribe **Psoraleae**

Key to genera

1a Flower pedicel subtended by a cupulum (a cup-shaped structure some distance below the flower); calyx lobes covered with black stubby hairs on inner face ..... **Psoralea**

1b Flower pedicel not subtended by a cupulum:

2a Fruit ovoid, with conspicuous black glandular warts when mature ..... **Cullen**
2b Fruit never with black glandular warts ..... **Otholobium**

Tribe **Robinieae**

Only one genus represented ..... **Sesbania**

Tribe **Sophoreae**

Key to genera

1a Flowers ± regular; the adaxial petal sometimes a little broader ..... **Amphimas**
1b Flowers irregular:
2a Lower petals ± similar, pinnately nerved (fine subsidiary basal nerves in *Camoensia*), or absent:
3a Leaves digitately 3-foliolate, stipellate; stamens joined; upper 2 calyx lobes ± joined; fruit a woody pod; lianes or climbing shrubs .. **Camoensia**
3b Leaves pinnate; stamens free; calyx lobes equal or very short:
4a Fruit torulose; testa thin (often attached to endocarp); standard abruptly expanded above claw, markedly unlike other petals ..... **Angylocalyx**
4b Fruit drupaceous; testa very hard; standard small, gradually broadened from claw, not so markedly unlike other petals, hairy ... **Xanthocercis**
2b Lower petals present, palmately nerved, generally differentiated into wings and keel but sometimes reduced in ornithophilous flowers:
5a Calyx lobes well formed, clearly imbricate, the overlap marked by a change in texture or indumentum; style incurved with terminal stigma; leaflets alternate to subopposite; seeds reddish ..... **Pericopsis**
5b Calyx lobes valvate to very slightly imbricate; stigma terminal; seeds various:
6a Leaves simple or 1-foliolate (with 1 or 2 pulvini):
7a Calyx cup- to bell-shaped with 5 short teeth:
8a Bracteoles large, enveloping the bud; seeds discoidal ..... **Dalhousiea**
8b Bracteoles small; seeds transversely oblong-ellipsoid, red, with cup-shaped aril ..... **Bowringia**
7b Calyx splitting to base on one or both sides:
9a Anthers longer than filaments; flowers in 2 rows on 1 side of rachis; seed 1 with a white, spongy cup-shaped aril ..... **Leucomphalos**
9b Anthers shorter than filaments; racemes not secund; seeds 1–several, with a small rim-aril ..... **Baphia**
6b Leaves compound:
10a Pod moniliform, stalked; flowers white, yellow or rarely blue-violet, in racemes or leafy panicles ..... **Sophora**
10b Pod not moniliform:
11a Pod broadly linear, ± winged or margined; flowers yellow ..... **Calpurnia**
11b Pod not winged; flowers mainly blue and pink ..... **Bolusanthus**

Tribe **Swartziae**

Key to genera

1a Petals 0; leaflets 10–30 per leaf, with many pellucid glands; stamen filaments confluent basally with the hypanthium (calyx tube) ..... **Cordyla**
1b Petals 1 or 6; leaves 1-foliolate or with less than 15 leaflets, without pellucid glands; stamen filaments free or almost so:
2a Petals 6, almost equal; leaves 1-foliolate ..... **Baphiopsis**
2b Petal 1, crinkled; leaves imparipinnate with less than 15 leaflets ..... **Swartzia**

Tribe **Trifolieae**

Key to genera

1a Petals becoming dry and persistent after flowering; filaments mostly dilated upwards; fruit indehiscent ..... **Trifolium**
1b Petals falling after flowering; filaments not dilated:
2a Flowers in slender racemes; ovules few; fruit indehiscent or tardily 2-valved ..... ***Melilotus**
2b Flowers in heads, umbels or short racemes or rarely solitary:
3a Fruit mostly spirally coiled, scarcely dehiscent, mostly prickly ..... ***Medicago**
3b Fruit straight or curved, mostly linear, not prickly:
4a Herbs, prostrate, rooting at nodes; stipules free from petioles, their base forming a ring around the stem ..... **Parochetus**
4b Herbs, mostly erect to suberect, not rooting at nodes; stipules adnate to petioles ..... ***Trigonella**

Tribe **Vicieae**

Only one genus represented ..... **Vicia**

Tribe **Millettieae** (=Tephrosieae)

Key to genera

1a Vegetative leaves (far) below the inflorescence, with 1 or 3 leaflets:
2a Fruits 1-seeded, globose or ellipsoid; leaves all 1-foliolate; flowers in axillary clusters all along the stems ..... **Requienia**
2b Fruits several-seeded:
3a Fruits contorted, thin-walled, indehiscent; leaves digitately 3-foliolate to 1-foliolate; flowers all axillary ..... **Ptycholobium**
3b Fruits not folded ..... **Tephrosia**
1b Vegetative leaves with 5 or more leaflets:
4a Leaflets distinctly alternate:

5a Undersurface of leaflets with hyaline pearl-glands; inflorescence consisting of a group of 2–4 axillary racemes; pod thick, woody ..... **Schefflerodendron**

5b Undersurface of leaflets without such glands; inflorescence a terminal or, less often, axillary raceme or a terminal panicle; pod thinly woody, dehiscent ..... **Craibia**

4b Leaflets opposite or subopposite:

6a Lateral nerves many (more than 30 pairs) and very close to each other; stipels and bracteoles generally absent; calyx lobes subequal; pseudoracemes terminal or leaf-opposed ..... **Tephrosia**

6b Lateral nerves less than 15 pairs, or if more than 15 pairs, the leaflets very large and lateral nerves distant; stipels present or absent:

7a Flowers in usually wide panicles (with the flowers singly in the axil of a bract), sometimes in terminal racemes, but then combined with axillary racemes ("leafy panicle"):

8a Vexillary stamen at least halfway connate with the other 9; calyx cupular; flowers small and unattractive; pod usually falcate, indehiscent or opening only at the apex, without wings or with one or both sutures narrowly keeled; trees or shrubs ..... **Philenoptera**

8b Vexillary stamen entirely free from the other 9:

9a Standard with 2 distinct basal inflexed appendages; calyx 2-lipped ..... **Dewevrea**

9b Standard with or without very indistinct basal appendages or only the margin thickened at the base; calyx not 2-lipped:

10a Stipules spinose; axillary panicles at the apex of branches, the apical part of which continues vegetatively after a flowering period; pod thin with a wing on the dorsal and on the ventral suture ..... **Xeroderris**

10b Stipules herbaceous or chartaceous; panicles terminal, sometimes combined with axillary racemes in the upper leaves or on leafless branches; pod thinly coriaceous, only woody around the seeds, with a wing on the dorsal and on the ventral suture ... **Aganope**

7b Flowers in pseudoracemes or in pseudopanicles:

11a Pseudoracemes single, axillary, sometimes on leafless branches below the leaves:

12a Standard with 2 distinct basal inflexed auricles; vexillar stamens connate with the other 9, at base with 2 translucent areas; pod thick, woody, flat, (1)2–5-seeded; seeds lens-shaped ..... **Millettia** subgen. **Otosema**

12b Standard without distinct basal appendages, sometimes the basal margin thickened:

13a Vexillary stamen free; trees or lianes; leaflets many, more than 11 per leaf; pod oblong, with many plumose appendages along the dorsal suture ..... **Dalbergiella**

13b Vexillary stamen connate with the other 9, usually with 2 translucent areas at the base:

14a Fascicles 3- or more-flowered ..... **Millettia** subgen. **Millettia**

14b Fascicles 2-flowered, often mixed with single flowers in the same pseudoraceme; trees or lianes; vexillary stamen connate with the other 9 ..... **Philenoptera** subgen. **Lonchocarpus**

11b Pseudoracemes terminal or arranged in a (terminal) pseudopanicle, or 2 or 3 (rarely more) pseudoracemes together in a leaf axil:

15a Vexillary stamen entirely free; pseudoracemes exclusively terminal:

16a Shrub; stipels absent; calyx with subequal lobes; pod thin, woody, dehiscent ..... **Mundulea**

16b Liane; stipels present; dorsal 2 calyx lobes enlarged, covering the standard completely; pod thick, woody, dehiscent or indehiscent ..... **Platysepalum**

15b Vexillar stamen at least halfway connate:

17a Standard with 2 basal, inflexed auricles:

18a Stipels always present; pseudoracemes in pseudopanicles; pod thin, indehiscent, with or without a dorsal wing . **Leptoderris**

18b Stipels present or absent; pseudoracemes terminal; pod thick, woody, without wings; trees or lianes .. **Millettia** subgen. **Otosema**

17b Standard without basal appendages:

19a Pod thick, woody, without wings; stipels present or absent; trees or lianes ..... **Millettia** subgen. **Millettia**

19b Pod thin, with 1 or 2 wings; stipels aways absent ..... **Derris** sect. **Derris**

Tribe **Phaseoleae**

Key to genera

1a Undersides of leaflets, calyces, sometimes the petals and other organs covered with gland dots (sometimes difficult to see if indumentum dense):

2a Ovary 3–8-ovuled; pod grooved between the seeds, linear-oblong, inflated, 45–100 mm long; cultivated shrub ..... ***Cajanus**

2b Ovary 2-ovuled; pod not grooved between the seeds, mostly smaller or more tapered to the base:

3a Shrubs with fasciculate, dense, axillary inflorescences; pods oblong-ovoid, somewhat inflated, 9–12 x 6 mm, densely but irregularly covered with dark red globules of secretion which stain yellow ..... **Flemingia**

3b Herbs or shrubs, mostly with pedunculate inflorescences, if sessile not dense, axillary and fasciculate; pods mostly (but not always) rather flattened, not bearing red globules of secretion:

4a Bracteoles present at the base of the calyx, caducous; style stiff, thickened below, bearded above; standard white, mauve or crimson-purple; pod oblong-falcate, much narrowed to the base ..... **Adenodolichos**

4b Bracteoles absent; style thinner, glabrous on upper part; standard usually yellowish, often with extensive reddish purple veining; pod not narrowed so conspicuously to the base:

5a Funicle inserted at middle of the circular hilum; flowers spreading; pod broadened upwards, 3–4 times as long as broad, pubescent, sometimes with longer hairs interspersed ..... **Rhynchosia**

5b Funicle attached at one end of the linear hilum; flowers deflexed; pod ovate or elliptic-oblong, abruptly contracted to the stipe, up to twice as long as broad, covered with long hairs (or in one section of the genus velvety) ..... **Eriosema**

1b Undersides of leaflets, etc. without conspicuous gland dots:

6a Pods covered with bristly irritant hairs; standard much shorter than the other petals; keel petals mostly horny at the apex; 5 larger sub-basifixed

anthers alternating with 5 shorter versatile or basifixed anthers; seeds large, either globose or oblong, with short hilum and conspicuous rim aril, or discoid with hilum occupying over half the circumference and no rim aril ..... **Mucuna**

6b Pods not covered with bristly irritant hairs and without other characters combined (note: many species have bristly hairs on their pods):

7a Mostly trees armed with strong prickles, stems sometimes annual from a woody rootstock; corolla mostly large, orange, scarlet or crimson, the standard usually larger than the other petals; pod often constricted between the seeds; seeds mostly red, orange or yellow, with a white or black hilum ..... **Erythrina**

7b Herbs, subshrubs or herbaceous to woody climbers, without prickles:

8a Calyx lobes, bracts and bracteoles with clavate gland-tipped apices; erect or climbing herbs or subshrubs; pod 15–30 x 8–9 mm, compressed, densely and coarsely appressed hairy ..... **Eminia**

8b Calyx lobes, bracts and bracteoles not gland-tipped:

9a Calyx obliquely truncate with no trace of teeth or scarcely any; seeds subglobose, black, remaining attached to the placenta after the pod dehisces ..... **Dumasia**

9b Calyx teeth developed; pods and seeds not as above:

10a Standard hairy outside (sometimes only finely so, but then standard much larger than the other petals); upper calyx lobes not completely joined:

11a Standard with a small spur 1–2 mm long on the outside above the claw; stipules and bracteoles with close parallel raised nerves; pods with longitudinal raised ribs on either side of the margins ..... ***Centrosema**

11b Standard without such a spur and without the other characters combined:

12a Standard much larger than the other petals, 30–50 mm long, very finely puberulous; pod 60–120 x 7–12 mm; commonest species with 5–7-foliolate leaves, others 3-foliolate ..... **Clitoria**

12b Standard not much larger than the other petals and often shorter than 30 mm; pods mostly shorter or narrower:

13a Corolla ± 10–20 mm long; inflorescences with long peduncles; style long, with tenuous basal part and curved bearded thickened upper part beaked beyond the lateral stigma; pods linear-cylindric ..... **Vigna** (in small part)

13b Corolla 4–11 mm long, if over 10 mm then inflorescences in sessile clusters; style short, not as above; pods linear-oblong to oblong:

14a Flowers in elongated lax inflorescences or if subsessile, then in axillary clusters; stamens monadelphous; pods over 20 mm long; ovules 2–8 and pods mostly more than 2-seeded; pods 17–65 x 4.5–8.0 mm ..... **Ophrestia**

14b Flowers in sessile or mostly stalked condensed inflorescences; stamens diadelphous; ovules 2 and pods 1- or 2-seeded; pods 12–20 x 6–8 mm ..... **Pseudoeriosema**

10b Standard glabrous outside, or if with a few marginal hairs then upper calyx lobes completely joined:

15a Alternate stamens sterile, lacking anthers; pods elongate, linear, distinctly upturned at the apex ..... **Teramnus**

15b All stamens with anthers (except very rarely in cleistogamous flowers, or in *Dioclea* where alternate anthers may be sterile); pods without a distinct upturned beak or if beaked then very short and never linear:

16a Pods longitudinally 4-winged; vexillary stamen connate above, free below; stigma terminal or internal, penicillate, or style with a conspicuous ring of hairs beneath it; bracteoles large; corolla blue or purplish (rarely yellow) ..... **Psophocarpus**

16b Pods not longitudinally 4-winged and without the other characters combined:

17a Style with a reflexed appendage beyond the stigma curved through 360–450°; keel curved inwards through 250–280°; basal corner of keel produced into a long erect spur ..... **Physostigma**

17b Style sometimes produced beyond the stigma as a beak but never reflexed back as an appendage; keel, if coiled without such a prominent spur:

18a Pods large, linear-oblong to oblong, usually with longitudinal ribs close to or on the upper margin, 100–400 x 25–50 mm; standard large, reflexed, 25–35 mm long; seeds 14–35 mm long; vexillary filament free below but connate above with the rest; calyx lobes unequal, the upper 2 rounded and larger than the lower 3; woody climbers or lianes:

19a Racemes terminal; bracts much smaller than flowers; anthers uniform ..... **Canavalia**

19b Racemes terminal; bracts much longer than flowers; anthers often alternately fertile and sterile ..... **Dioclea**

18b Pods and seeds never so large or if nearly so, then pods without ribs; if vexillary stamen connate then corolla smaller:

20a Vexillary stamen and other short stamens with a pair of fused glands below the anthers; division of style into tenuous and thickened portions obscure but upper part densely barbate; pollen grains without evident sculpture .... **Vigna** (subgen. **Haydonia**)

20b Vexillary and other short stamens without a pair of glands below the anthers:

21a Style distinctly flattened and spathulate at the apex:

22a Bracteoles shorter than the calyx tube; upper calyx lobes completely or not completely connate; standard without appendages; filaments less dilated above, the vexillary one basally dilated but without a tooth at the base; seeds not arillate ..... **Sphenostylis**

22b Bracteoles as long as the calyx tube and sometimes broad; upper calyx lobes completely joined to form a truncate lip; standard with appendages; filaments dilated at the apex, the vexillary one with a tooth at the base; seeds arillate ..... **Nesphostylis**

21b Style various but not apically flattened and spathulate (somewhat so at the very tip in *Dolichos junodii* from southern Mozambique, but then covered with long hairs):

23a Style with a distinct bulging eccentric callus at its junction with the ovary; style under half the length of the ovary; bracteoles absent; usually an extensive climber but sometimes erect and flowering when leafless or almost so ..... **Neorautanenia**

23b Style without a callus at its junction with the ovary:
24a Style divided into a thin basal part and a thick hardened upper part:
25a Style with thickened part (together with the keel) twisted through more than 360°, with the stigma terminal but not penicillate; stipules not produced below point of attachment; standard mostly without appendages; pods oblong to linear-lanceolate, 45–200 x 7–25 mm; pollen grains with no or very fine sculpture ..... ***Phaseolus**
25b Style with thickened part twisted through no more than 360°, usually up to 180°:
26a Thickened part of the style characteristically abruptly curved through 90° just above its junction with the tenuous part and narrowed and slightly curved towards the apex, resembling a squarish hook; stipules not produced below the point of attachment; wings round, large, longer than the standard and keel; claws of wings and keel long, partly adnate to the staminal tube; pods long, cylindrical; pollen grains finely reticulate ..... ***Macroptilium**
26b Thickened part of the style not of this characteristic hook-like shape and without the other characters combined:
27a Thickened part of the style curved through 180–360°; stigma terminal, penicillate with a ring of simple or branched hairs but rest of thick part of the style glabrous; thin part of the style extremely slender, filiform; stipules not produced below the point of insertion; pod long, linear; pollen grains strongly but not widely reticulate; twiner with usually precocious flowers in axillary fascicles ..... **Decorsea**
27b Thickened part of the style curved through 90–360°; stigma lateral or nearly so, not penicillate and style often produced as a beak beyond it; thick part of style usually densely bearded; thin part often ribbon-like; stipules often but not always produced below the point of insertion; pollen grains, except in a few species, with a very open raised reticulation ..... **Vigna**
24b Style either uniformly thick or uniformly thin or tapering upwards or downwards, but not distinctly of two parts:
28a Style distinctly thickened; standard mostly purple and with distinct appendages inside near the base:
29a Style conspicuously flattened laterally, straight and blade-like throughout its length, forming an angle of just less than 90° with the ovary ..... **Lablab**
29b Style subterete at least in the upper part (sometimes expanded apically):
30a Style expanded at the tip into a horizontal spoon-like cover, from which is suspended the spherical stigma, glabrous; upper wing spurs greatly developed ..... **Otoptera**
30b Style tapered, with a terminal generally penicillate stigma; wings not markedly auriculate ..... **Dolichos**
28b Style not distinctly thickened, often short and inconspicuous; standard mostly without appendages (not to be confused with auricles where claw and blade meet):
31a Pods rather distinctly transversely grooved, the grooves corresponding to strong internal septa, densely covered with spreading somewhat ferruginous hairs as on the stems; climbers with blue flowers in sessile or stalked clusters; standard 7–10 mm long ..... ***Calopogonium**
31b Pods not distinctly transversely grooved or if slightly so not so conspicuously septate and inflorescences lax and elongate:
32a Pods oblong, 6–10 mm wide, densely covered with stiff spreading bristly hairs; leaflets usually lobed and sericeous beneath with long appressed hairs; standard purple, violet, pink or white, 13–26 mm long, without appendages; seeds with a reticulate coating:
33a Stigma not penicillate; style filiform and hairy on the basal part, upper third virtually glabrous; inflorescence long, and long-stalked ..... **Pseudeminia**
33b Stigma penicillate; style tenuous and glabrous, the upper part more cylindrical but not really thickened; inflorescence short, subsessile ..... **Pseudovigna**
32b Pods glabrous to densely hairy but if covered with spreading hairs then pods longer, linear and usually under 6 mm wide (except the cultivated soya bean, *Glycine max*) or inflated:
34a Bracteoles absent; inflorescence slender and lax, the many flowers in groups of 2 or 3; standard mauve or violet, 8–16 mm long; pods glabrous except sometimes for densely ciliate margins; bracts conspicuous, seriate, persistent; calyx tubular, the standard thus reflexing only towards the apex; pods flattened; seeds not arillate ..... **Amphicarpaea**
34b Bracteoles present; other features not combined:
35a Corolla greenish yellow, cream-coloured or yellow, sometimes with a pink or purple mark; standard 6–26 mm long, provided inside with 2 long, linear, lamelliform appendages; stigma terminal, usually ± distinctly penicillate; pollen grains covered with short blunt tubercles ..... **Macrotyloma**
35b Corolla blue, mauve, violet or white; standard 3–14 mm long, devoid of appendages:
36a Leaflets elliptic-oblong, obtuse or emarginate; pods (15–)30–60(–80) x 5–10 mm; upper calyx lobes united to form an entire lip; vexillary filament free ..... **Galactia**
36b Leaflets elliptic or ovate, acute or acuminate; pods (7–)15–36 x 2.5–5.0 mm; upper calyx lobes almost completely united but lip narrowly bifid at the apex; vexillary filament joined to the others, at least initially; flowers in clusters along the extended rachis; climbing or trailing ..... **Neonotonia**

Abrus Adans.

(Papilionoideae—Abreae)

Torre: 3 (1966);White: 138 (1962); Lock: 100 (1989).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Acacia Mill.

(Mimosoideae—Acacieae)

Torre: 269 (1956); White: 76 (1962); Brenan: 53 (1970); Ross: 1 (1979); Lock: 62 (1989); White *et al.*: 310 (2001); Coates Palgrave: 264 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. ± 60, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. The following exotic species of *Acacia* have become naturalised in eastern Zimbabwe and perhaps elsewhere in the region: **A. baileyana* F.Muell., **A. cyclops* G.Don, **A. dealbata* Link, **A. decurrens* Willd., **A. elata* Benth., **A. farnesiana* (L.) Willd., **A. longifolia* (Andrews) Willd., **A. mearnsii* De Wild., **A. melanoxylon* R.Br. and **A. saligna* (Labill.) H.L.Wendl. [Coates Palgrave: 271 (2002)].

Adenocarpus DC.

(Papilionoideae—Genisteae—Genistinae)

Candolle: 549 (1815); Torre: 79 (1962); White: 138 (1962); Gibbs: 67 (1967); Milne-Redhead: 1009 (1971); Cristofolini & Feoli-Chiapella: 457 (1984); Lock: 266 (1989); White *et al.*: 322 (2001).

Much-branched shrubs, with silky or villous indumentum. **Leaves** digitately 3-foliolate; stipules small and caducous or absent. **Inflorescence** terminal, racemose. **Calyx** 2-lipped, upper lip deeply bifid, lower one tridentate or 3-lobed. **Corolla**: standard suborbicular, slightly longer than the obovate or oblong wings; keel much incurved or shortly beaked. **Stamens** all joined into a closed tube; anthers alternately long and short. **Ovary** sessile, many-ovulate. **Pod** linear-oblong, compressed, dehiscent, 3–8-seeded, glandular-tuberculate or muricate. **Seeds** mostly oblong-ovate in outline, compressed, smooth, with a small hilum; rim-aril inconspicuous.

Species 15, Mediterranean and Atlantic islands, with one outlier on trop. African mountains: *Adenocarpus mannii* (Hook.f.) Hook.f.; sthn trop. Afr.: Angola, Zambia, Malawi, Mozambique.

Adenodolichos Harms

(Papilionoideae—Phaseoleae—Cajaninae)

Harms: 179 (1902); Torre: 297 (1966); Verdcourt: 65 (1971a); Gonçalves: 60 (1981); Lock: 386 (1989); Verdcourt: 242 (2001).

Dolichos L. sect. *Rhynchosiopsis* Harms.

Herbs, subshrubs or shrubs, erect or prostrate, often glandular. **Leaves** alternate or opposite, pinnately or rarely digitately 3–5-foliolate, rarely 2-foliolate; leaflets glandular beneath; stipules not spurred, deciduous or ± persistent; stipels usually present. **Inflorescences** axillary or terminal, racemose or paniculate; rachis slightly swollen at insertion of pedicels; bracts and bracteoles present. **Calyx** 5-lobed, 2-lipped; upper lip entire to deeply bifid, lower lip 3-lobed. **Corolla** medium-sized, white or more usually purplish; standard obovate or rounded, emarginate, auriculate and with 2 obscure to well-developed appendages, glabrous; wings with long spur at base of lamina. **Stamens**: vexillary stamen free; 5 basifixed anthers alternating with 5 shorter medifixed ones. **Ovary** ellipsoidal, 2-ovuled; style incurved, laterally flattened, swollen at base, barbate above on inner side; stigma terminal, oblique, ± folded. **Pods** oblong-falcate, compressed, beaked with persistent curved style base, narrowed below, ± glandular. **Seeds** 1 or 2, usually rounded and compressed; hilum grooved; rim aril developed or absent.

Species ± 15, confined to trop. Africa; sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique. The genus has very much the facies of *Rhynchosia* but differs in style characters. The species are very difficult to define and the taxonomy of the genus is poorly understood.

Adenolobus (Harv. ex Benth.) Torre & Hillc.

(Caesalpinioideae—Cercideae)

Torre & Hillcoat: 194 (1956); Brummitt & Ross: 399 (1976); Lock: 40 (1989); Coates Palgrave: 337 (2002).

Sthn trop. Afr. 2, Angola, and sthn Afr.

Adenopodia C.Presl

(Mimosoideae—Mimoseae)

Brenan: 73 (1986); Lock: 87 (1989); Coates Palgrave: 312 (2002).

Entada Adans. in part; Torre: 257 (1956).

Sthn trop. Afr. 2, Angola, Mozambique, and sthn Afr.

Aeschynomene L.

(Papilionoideae—Aeschynomeneae—Aeschynomeninae)

White: 138 (1962); Torre: 192 (1966); Verdcourt: 364 (1971b);Verdcourt: 370 (1974); Lock: 101 (1989); Verdcourt: 58 (2000); White *et al.*: 322 (2001); Bingham & Smith: 141 (2002); Coates Palgrave: 383 (2002).

Sthn trop. Afr. 66, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Afzelia Sm.

(Caesalpinioideae—Detarieae)

Torre & Hillcoat: 214 (1956); Lock: 45 (1989); Bingham & Smith: 141 (2002); Coates Palgrave: 331 (2002).

Intsia Thouars; Hiern: 299 (1896).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aganope Miq.

(Papilionoideae—Millettieae)

Miquel: 151 (1855); Polhill: 266 (1971a); Lock: 349 (1989).

Derris Lour. in part; Baker: 244 (1871). *Ostryoderris* Dunn in part; De Sousa: 367 (1966).

Climbing, evergreen shrubs. **Leaves** alternate, imparipinnate; lateral leaflets in ± 3–5 pairs, opposite or subopposite, somewhat coriaceous, glossy above. **Inflorescence**: a thyrsoid panicle, terminal or in axils of upper leaves; bracts linear to ovate, often caducous. **Calyx**

campanulate, minutely 5-toothed. **Disc**, if apparent, generally ± 10-lobed. **Corolla** creamy white; standard occasionally greenish, sometimes marked with pink, ± glabrous, shortly clawed; wings generally free from keel, sometimes lightly coherent; keel petals ± as long as wings, partially coherent along lower margin. **Stamens** diadelphous, vexillary one free; anthers all similar, dorsifixed. **Ovary** sessile or shortly stipitate; style tapering, terminating in a minute stigma; ovules ± 10. **Fruit** indehiscent, flattened, elongate, margined with a wing on one or both sides, venose; valves coherent between seeds. **Seeds** ± oblong-obovoid; radicle short, spreading in mature seeds.

Species 4, trop. Africa; sthn trop. Afr. 1: *Aganope lucida* (Baker) Polhill, Angola.

Albizia Durazz.

(Mimosoideae—Ingeae)

Torre: 288 (1956); Burtt Davy *et al.*: 65 (1958) as *Albizzia*; White: 88 (1962); Brenan: 113 (1970); Lock: 80 (1989); White *et al.*: 312 (2001); Coates Palgrave: 255 (2002).

Cathormion (Benth.) Hassk.; Torre: 298 (1956); White: 91 (1962); Brenan & Brummitt: 137 (1970). *Pithecellobium* Mart. in part; White: 93 (1962). *Samanea* (DC.) Merr.; White: 94 (1962); Brenan & Brummitt: 135 (1970).

Sthn trop. Afr. 30, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Alysicarpus Desv.

(Papilionoideae—Desmodieae—Desmodiinae)

Torre: 234 (1966); Verdcourt: 491 (1971b); Verdcourt: 544 (1974); Lock: 243 (1989); Verdcourt: 36 (2000).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Amblygonocarpus Harms

(Mimosoideae—Mimoseae)

Torre: 264 (1956); White: 90 (1962); Brenan & Brummitt: 35 (1970); Lock: 87 (1989); Coates Palgrave: 305 (2002).

Sthn trop. Afr. 1: *Amblygonocarpus andongensis* (Welw. ex Oliv.) Exell & Torre, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Amphicarpaea Elliott ex Nutt.

(Papilionoideae—Phaseoleae—Glycininae)

Nuttall: 113 (1818); White: 143 (1962) as *Amphicarpa*; Verdcourt: 511 (1971b) as *Amphicarpa*; Lock: 388 (1989); Mackinder: 60 (2001).

Climbing herbs. **Leaves** pinnately 3-foliolate; stipels present. **Flowers** in lax racemes, sometimes dimorphic with cleistogamous flowers; bracts conspicuous, striate, but bracteoles absent. **Calyx** 5-lobed, but with the two upper lobes connate. **Corolla** small; standard obovate, glabrous. **Stamens**: vexillary stamen free, rest fused into a sheath; anthers uniform, or, in cleistogamous flowers, up to 5 fertile. **Ovary** shortly stipitate, many-ovuled; style geniculate, filiform, beardless; stigma capitate, terminal, or, in cleistogamous flowers, style short with stigma angled such that it is in contact with anthers. **Pod** linear or falcate, compressed. **Seeds** variously coloured, subglobose or ovoid, with a short lateral hilum.

Species ± 3, N and tropical America, extending to Asia, with 1 species: *Amphicarpaea africana* (Hook.f.) Harms in trop. Africa; sthn trop. Afr.: Zambia, Malawi. The generic name was originally spelt *Amphicarpa*, but it has been conserved with the spelling used here.

Amphimas Pierre ex Harms

(Papilionoideae—Sophoreae)

Harms: 157 (1906); Wilczek: 546 (1952); Torre & Hillcoat: 169 (1956); Aubréville: 28 (1968b); Lock: 465 (1989).

Trees. **Leaves** pinnate; leaflets 11–19, alternate or opposite, oblong-ovate, rounded to cordate at base; each with a persistent filiform stipel at base. **Inflorescences** terminal panicles with many dense, many-flowered spike-like branches. **Flowers** bisexual or unisexual by abortion; pedicels articulated at apex; bracts lanceolate, caducous. **Calyx** campanulate, with 5 short, equal, deltoid lobes valvate in bud. **Petals** 5, divided up to middle into 2 linear lobes, recurved and crumpled in bud. **Stamens** 10, united at base into a cup, slightly exserted, opposite petals. **Ovary** long-stipitate, hirsute; ovules 2. **Pod** narrowly elliptic, flattened, central part very narrowly elliptic, reticulate, entirely surrounded by a broad longitudinally striate part. **Seeds** 1(2), kidney-shaped, brown.

Species 2–4, trop. Africa (Guineo-Congolian); sthn trop. Afr. 1 or 2, Angola.

Angylocalyx Taub.

(Papilionoideae—Sophoreae)

Taubert: 172 (1896); Baker: 133 (1928); Hillcoat: 383 (1966); Polhill: 36 (1971b); Lock: 465 (1989).

Trees or shrubs. **Leaves** imparipinnate; stipules small; stipels lacking; lateral leaflets few, alternate to subopposite, often acuminate. **Flowers** in racemes, generally clustered on old wood, sometimes amongst leaves; bracts and bracteoles small; pedicels jointed. **Hypanthium** conical, at least half as long as calyx, with ovary arising near base on upper side, sometimes slightly gibbous; calyx continuing or at an angle to line of hypanthium, tubular, very shortly and broadly lobed to subtruncate, usually torn to some extent as corolla opens, bearing petals and stamens on a rim at base. **Petals** subequal in length, glabrous except sometimes on standard outside; standard elliptic to orbicular with a well-developed claw; wings asymmetrically lanceolate, not or scarcely auriculate at base of blade, free or lightly adnate to keel; keel-petals similar but narrower, free or lightly adnate. **Stamens** free; anthers subbasifixed. **Ovary** stipitate, ± 8–20-ovulate; style relatively short, bent upwards, glabrous on upper part, with a small terminal stigma. **Pod** torulose, beaked, indehiscent. **Seeds**: testa adhering to fruit wall; embryo detached and lying free within, oblong-ellipsoid or shortly cylindrical, with a very short straight radicle near one end.

Species 7, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda).

Anthonotha P.Beauv.

(Caesalpinioideae—Detarieae)

Beauvois: 70 (1806); Exell & Hillcoat: 200 (1956); Brenan: 153 (1967); Lock: 1 (1989).

Macrolobium partly in sense of some African authors; Baker: 139 (1928); Léonard: 409 (1952b) in part.

Unarmed evergreen trees. **Leaves** paripinnate; stipules free, or connate into an intrapetiolar scale; petiolules not twisted; leaflets opposite, in (1)2–7 pairs, petiolulate, equal-sided or nearly so at base, without translucent gland dots. **Flowers** in lateral or terminal panicles, or sometimes racemes; bracteoles 2, well-developed, valvate, completely enclosing flower buds, persistent. **Hypanthium** ± shortly tubular or cupuliform. **Sepals** 4 or 5, equal, or with 1 larger than others. **Petals** 2–6, equal, or with 1–3 larger than others. **Stamens** (6–)9(10), free; usually 3(–5) of them large and 1–7 ± reduced, small and staminodial. **Ovary** with 2–5 ovules. **Pods** dehiscing into 2 flattened woody valves with ± transverse nerves. **Seeds** large, ± compressed, non-areolate, with thin testa and short funicle.

Species 28, trop. Africa; sthn trop. Afr. 4, Angola.

Antopetitia A.Rich.

(Papilionoideae—Coronilleae)

Richard: 261 (1840); Léonard: 178 (1954b); Gillett: 1049 (1971); Verdcourt: 555 (1974); Gonçalves: 63 (1981); Lock: 123 (1989).

Spreading to erect, pubescent annuals. **Leaves** imparipinnate; petiole absent or very short; leaflets 5–11, alternate or subopposite, narrowly elliptic to linear-oblanceolate, rounded to acute at apex, cuneate at base; stipels absent or very short; stipules reduced to glands. **Inflorescences** axillary, pedunculate, 2–8-flowered umbels; bracts and bracteoles minute, caducous. **Flowers** small. **Calyx** pubescent; receptacle obconic; teeth subequal, narrowly triangular. **Corolla** glabrous; petals with claws ± as long as blades. **Stamens** 10, diadelphous; vexillary one completely free; free parts of filaments flattened; anthers uniform. **Ovary** stipitate, glabrous, arising laterally on receptacle; ovules many; style very short, curved; stigma enlarged. **Pod** curved, made up of 2–5 spherical, 1-seeded articles, each of which splits into 2 valves; dorsal suture persistent. **Seeds** spherical, minutely warty; hilum circular, minute.

Monotypic genus: *Antopetitia abyssinica* A.Rich., trop. African mountains; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique.

Aphanocalyx Oliv.

(Caesalpinioideae—Detarieae)

Oliver: t. 1066 (1870); Baker: 733 (1930); Léonard: 438 (1952b); Aubréville: 274 (1968b); Wieringa: 115 (1999); Bingham & Smith: 141 (2002); Gervais & Bruneau: 30 (2002); Brummitt (Unpublished).

Monopetalanthus Harms in part: 195 (1897); Exell & Hillcoat: 203 (1956); White: 126 (1962); Brenan: 196 (1967); Lock: 16 (1989).

Shrubs or small to large trees. **Leaves** paripinnate, 1–57-jugate; rachis ± terete, sometimes with a poorly developed (grooved) rib on upper side; leaflets opposite, distal half usually completely absent, resulting in distal margin being formed by the midrib, both halves (as far as present) with glands; stipules completely fused, with many closely spaced veins. **Inflorescence** a compound raceme, in most species reduced to a single raceme; bracts densely parallel-veined, glabrous inside; bracteoles fused with sepals, petals and stamens into a short hypanthium. **Sepals** up to 5, but some or all usually absent; adaxial sepals free to fused. **Petals**: adaxial petal fully developed; lateral and abaxial ones reduced and often absent. **Stamens** usually 10, all fertile; adaxial stamen free, 9 united at base; filaments filiform, glabrous; anthers small, broadly elliptic, often with small to large dorsal teeth, longitudinally dehiscent. **Ovary** on a short stipe, hairy; ovules 1–6; style insertion not hooked, angle 0–90°. **Pod** compressed, dehiscing with 2 woody valves, lateral nerve usually distinct, running fairly high and sometimes fused to dorsal wings, dorsal suture sometimes distinctly winged. **Seeds** disc-shaped; testa thin.

Species 14, W and C Africa; sthn trop. Afr. 4, Angola, N Zambia.

***Arachis** L.

(Papilionoideae—Aeschynomeneae—Stylosanthinae)

Linnaeus: 741 (1753); Hiern: 239 (1896); Verdcourt: 169 (2000).

Annual, erect or straggling herbs. **Leaves** paripinnately 4-foliolate; leaflets obovate or elliptic, mucronate at apex; stipules partly adnate to petiole, linear-lanceolate, very acute, ciliate, veined, persistent; stipels absent. **Flowers** axillary, apparently solitary and stalked; primary bracts ovate-lanceolate, biapiculate; secondary bracts similar but 2-fid; receptacle long and filiform, pedicel-like. **Calyx** membranous, filiform, 5-lobed: 4 upper lobes joined, lower one ± free. **Corolla** yellow, usually with red nerves; standard rounded, shortly narrowed at base; wings free; keel beaked, incurved. **Stamens** 8 or 9, all joined; 4 or 5 anthers elongate and sub-basifixed, alternating with 4 or 5 short and versatile ones. **Ovary** subsessile, situated at base of receptacular tube, linear; ovules (1)2–4(–7); style filiform, very long, soon deciduous; stigma terminal, minute. **Pod** oblong or sausage-shaped, 1–6-seeded, somewhat constricted between seeds but not articulated, continuous inside, functionally indehiscent; walls thick and reticulate, developing below soil, having been pushed beneath by considerable lengthening, reflexing and stiffening of gynophore. **Seeds** irregularly ovoid or oblong; cotyledons thick and fleshy, rich in oil.

Species ± 20, S America; sthn trop. Afr. 1: **Arachis hypogaea* L. the ground-nut, is widely cultivated; sthn trop. Afr., and is occasionally found as an escape.

Argyrolobium Eckl. & Zeyh.

(Papilionoideae—Genisteae—Genistinae)

Torre: 77 (1962); Polhill: 1000 (1971b); Lock: 267 (1989).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Astragalus L.

(Papilionoideae—Galegeae—Astragalinae)

Gillett: 1054 (1971); Lock: 251 (1989).

Sthn trop. Afr. 1: *Astragalus atropilosulus* (Hochst.) Bunge subsp. *abyssinicus* (Hochst.) Gillett, Zambia, Zimbabwe, Malawi, and sthn Afr.

Baikiaea Benth.

(Caesalpinioideae—Detarieae)

Léonard: 296 (1952b); Torre & Hillcoat: 217 (1956); Lock: 45 (1989); Bingham & Smith: 141 (2002); Coates Palgrave: 329 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, and sthn Afr.

Baphia Afzel. ex Lodd.

(Papilionoideae—Sophoreae)

Baker: 131 (1928); Burtt Davy *et al.*: 74 (1958); White: 143 (1962); Hillcoat: 373 (1966); Brummitt: 49 (1971); Soladoye: 291 (1985); Lock: 466 (1989); Bingham & Smith: 141 (2002); Coates Palgrave: 358 (2002).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Baphiopsis Benth. ex Baker

(Papilionoideae—Swartzieae)

Baker: 256 (1871); Brenan: 216 (1967); Lock: 476 (1989).

Unarmed evergreen trees or shrubs. **Leaves** alternate, unifoliolate; stipules very small and soon falling off; blade without pellucid dots. **Flowers** bisexual, in short racemes or almost fasciculate, each flower subtended by 2 small nervose caducous bracteoles. **Calyx** ellipsoid and entire before dehiscence, opening by a single slit and reflexing, or becoming divided into 2 or 3 lobes; no disc or cupular hypanthium. **Petals** 6, almost equal, imbricate, upper one with its margins overlapped. **Stamens** 13–41, arranged around base of ovary, free or almost so; anthers basifixed, dehiscing by longitudinal slits; connective not glandular. **Ovary** sessile or nearly so, 2–5-ovuled, tapering upwards into a subulate style which is bent in its upper part and bears a minute capitate stigma. **Pods** thick, beaked 1(2)-seeded. **Seeds** large, thin-walled, apparently not arillate, without endosperm; embryo curved.

Monotypic genus: *Baphiopsis parviflora* Baker, trop. Africa; sthn trop. Afr: Angola.

Bauhinia L.

(Caesalpinioideae—Cercideae)

Torre & Hillcoat: 192 (1956); White: 99 (1962); Lock: 41 (1989); Coates Palgrave: 333 (2002).

Gigasiphon Drake; Torre & Hillcoat: 196 (1956).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Berlinia Sol. ex Hook.f.

(Caesalpinioideae—Detarieae)

Hooker: 326 (1849); Troupin: 285 (1950); Hauman: 476 (1952a); Hauman: 387 (1952b); Torre & Hillcoat: 205 (1956); Brenan: 143 (1967); Aubréville: 242 (1970); Lock: 4 (1989).

Unarmed trees. **Leaves** paripinnate; stipules intrapetiolar, connate into a scale (at least on mature shoots); leaflets opposite or subopposite, in (1)2–5 pairs, petiolulate, equal or ± unequal-sided at base, with or without translucent dots. **Flowers** in racemes or panicles of racemes; bracteoles 2, well-developed, valvate, completely enclosing flower buds, persistent. **Hypanthium** tubular, 7–20 mm long. **Sepals** 5, subequal. **Petals** 5: upper one relatively very large and long-clawed, 4 others much reduced. **Stamens** 10; filaments exserted, 9 of them shortly connate at base, the other one free. **Ovary** shortly stipitate, arising on tube of hypanthium; ovules 2–8. **Pod** dehiscing elastically into 2 flattened woody valves which are obliquely transversely nerved when mature; upper suture narrowly winged on each side. **Seeds** compressed, ± obovate-elliptic to elliptic or quadrate, with thin testa and short funicle.

Species 15, trop. Africa; sthn trop. 11, Angola, Zambia, Mozambique.

Bolusanthus Harms

(Papilionoideae—Sophoreae)

White: 144 (1962); Lock: 473 (1989); Coates Palgrave: 356 (2002).

Monotypic genus: *Bolusanthus speciosus* (Bolus) Harms; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bolusia Benth.

(Papilionoideae—Crotalarieae)

Torre: 76 (1962); Polhill: 995 (1971b); Lock: 161 (1989); Lisowski: 907 (1995).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Bowringia Champ. ex Benth.

(Papilionoideae—Sophoreae)

Bentham: 75 (1852); Harms: 432 (1913); Toussaint: 6 (1953); Hillcoat: 380 (1966); Lock 473 (1989).

Scandent, glabrous shrubs or small lianes. **Leaves** unifoliolate, petiole long, articulate at apex; oblong to lanceolate-oblong; stipules falcate, soon caducous. **Inflorescences** racemes or subsessile panicles; bracts ovate; bracteoles 2, ovate, soon caducous. **Calyx** broadly cup-shaped, with 5 very short teeth, margin minutely fimbriate. **Petals**: vexillum suborbicular, very shortly clawed, apex emarginated; wings oblique-oblong; keel of lightly cohering petals resembling wings. **Stamens** 10, free; filaments glabrous. **Ovary** long-elliptic, stipitate, glabrous; ovules ± 9; style falcate; stigma capitate, minute. **Pod** stipitate, ovoid to suborbicular, membranous, inflated bladder-like, dehiscent. **Seeds** ellipsoid with a cup-shaped arillus.

Species 4: 1 in Magadascar, 1 in N China, 2 in W trop. Africa; sthn trop. Afr. 1, *Bowringia mildbraedii* Harms, Angola.

Brachystegia Benth.

(Caesalpinioideae—Amherstieae)

Baker: 145 (1928); Hoyle: 221 (1956); White: 101 (1962); Hoyle: 157 (1967); Lock: 6 (1989); Chikuni: 175 (1998); Hoyle & Brummitt: 155 (1999); White *et al.*: 305 (2001); Bingham & Smith: 151 (2002); Coates Palgrave: 320 (2002).

Sthn trop. Afr. 22, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Brenaniodendron J.Léonard

(Caesalpinioideae—Detarieae)

Léonard: 9 (1999a); Coates Palgrave: 346 (2002).

Unarmed evergreen trees. **Leaves** always paripinnate; leaflets 3–20, always opposite, with some gland-dots underneath. **Inflorescence** racemose. **Flowers** bisexual, spirally arranged along inflorescence axis; receptacle cupuliform, very short, much shorter than sepals; pedicels not jointed; bracteoles very

small, not enclosing flower buds. **Sepals** 4, imbricate, ± glabrous inside. **Petals** 5, subequal. **Stamens** 10; filaments free, equal, glabrous, 2–2½-times as long as anthers; anthers narrowly elliptic, dehiscing by longitudinal slits. **Ovary** stipitate, pubescent near margins; stipe of ovary adnate to wall at bottom of receptacle; ovules 2; style elongate; stipe, ovary and style together clearly longer than stamens; stigma capitate. **Pods** flattened, woody, dehiscing elastically into 2 valves, with low wing-shaped ridges to both sides of ventral suture. **Seeds** large, compressed, with thin wall, exareolate.

Monotypic genus: *Brenaniodendron carvalhoi* (Harms) J.Léonard (=*Cynometra carvalhoi* Harms), Mozambique.

Burkea Benth.

(Caesalpinioideae—Caesalpinieae)

Torre & Hillcoat: 250 (1956); Brenan: 21 (1967); Lock: 20 (1989); Coates Palgrave: 316 (2002).

Monotypic genus: *Burkea africana* Hook., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bussea Harms

(Caesalpinioideae—Caesalpinieae)

Harms: 159 (1902); Torre & Hillcoat: 173 (1956); Brenan 25 (1967); Lock: 20 (1989); Bingham & Smith: 141 (2002); Coates Palgrave: 345 (2002).

Shrubs or more usually trees, unarmed and always with brown or rusty indumentum on young shoots and also inflorescences. **Leaves** usually opposite or subopposite, but varying sometimes to alternate, bipinnate; stipules small, subulate; specialized glands restricted to petiole and rhachis or absent; leaflets usually opposite, eglandular. **Inflorescences** of terminal panicles with flowers densely and racemosely arranged along branches; rarely and casually (in *B. massaiensis*) inflorescence reduced to a simple raceme; bracts small, falling as, or before flowers open. **Flowers** bisexual. **Sepals** 5, imbricate, inner ones with hyaline erose margins. **Petals** 5, upper one smaller than rest, all with rusty indumentum in middle and on claw. **Stamens** 10; filaments rusty-tomentose at base, eglandular; anthers dorsifixed, dehiscing by longitudinal slits. **Ovary** free, subsessile, densely brown-tomentose; ovules 2 or 3; style ± clothed like ovary; stigma enlarged and peltate. **Pods** erect, linear-oblanceolate, ± compressed, not winged, elastically dehiscing into 2 recurving woody valves each of which has a conspicuous longitudinal groove down middle. **Seeds** 1–3, longitudinal; funicle short; endosperm absent.

Sthn trop. Afr. 3, Angola, Zambia, Mozambique.

Caesalpinia L.

(Caesalpinioideae—Caesalpinieae)

Brenan: 28 (1967); Lock: 20 (1989); White *et al.*: 306 (2001); Coates Palgrave: 343 (2002).

Mezoneuron Desf. (as *Mezoneurum*); Torre & Hillcoat: 170 (1956); White: 125 (1962).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. **Caesalpinia decapetala* (Roth) Alston from Asia is a serious weed in moister parts of Zimbabwe.

***Cajanus** DC.

(Papilionoideae—Phaseoleae—Cajaninae)

Baker: 119 (1928); Lock: 388 (1989); Verdcourt: 163 (2001).

Sthn trop. Afr.: **Cajanus cajan* (L.) Millsp., widely cultivated throughout the tropics and subspontaneous in many areas, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Calopogonium** Desv.

(Papilionoideae—Phaseoleae—Diocleinae)

Desvaux: 423 (1826); Lock: 389 (1989); Verdcourt: 62 (2001).

Herbaceous or woody climbers or trailers. **Leaves** pinnately 3-foliolate; stipels present. **Flowers** blue or violet, small, in fascicles arranged in short to long axillary nodose pseudoracemes, or in axillary subsessile fascicles; bracts and bracteoles small, deciduous. **Calyx** campanulate or shortly tubular, 5-lobed, upper pair free or ± connate to form a 2-toothed lip. **Petals**: standard obovate, auriculate at base, auricles inflexed; wings narrow, adhering to obtuse keel. **Stamens**: vexillary stamen free; anthers mostly 8 or 9, all similar. **Ovary** sessile, many-ovuled; style filiform or subulate, usually ± incurved, glabrous or pubescent; stigma terminal, capitate. **Pods** linear or linear-oblong, ± compressed, 2-valved, dehiscent, mostly septate between seeds, outer surface transversely furrowed, giving the appearance that pod might break into segments. **Seeds** compressed-globose or oblong.

Species 6–8, confined to the warmer parts of America; 1 species: **Calopogonium mucunoides* Desv., now widely cultivated as a cover crop and often found as an escape in the Old World tropics; in sthn trop. Afr. reported as an escape in Malawi.

Calpocalyx Harms

(Mimosoideae—Mimoseae)

Harms: 191 (1897); Mendes: 163 (1963); Villiers: 297 (1984); Lock: 87 (1989); Villiers: 96 (1989).

Shrubs or small trees; trunk much branched; branchlets glabrous. **Leaves** bipinnate, consisting of a single pair of pinnae each bearing 3–7 pairs of opposite leaflets with basal leaflet often single; leaflets elliptic-oblanceolate with asymmetric base. **Inflorescences** with flowers crowded in dense, narrowly cylindric spikes on long peduncles arranged in ample terminal, or sometimes axillary panicles. **Flowers** bisexual or unisexual by abortion. **Calyx** campanulate, 5-lobed. **Petals** 5, cohering in lower half. **Stamens** 10; filaments filiform, arising at base of petals, free or slightly coherent at base; anther connective ending in a caducous gland. **Ovary** ± stipitate, oblong, pubescent, arising in bottom of receptacle; ovules 4 or 5; style slender, ending in a tapering stigma. **Pod** dehiscing with 2 glabrous, triangular, woody valves.

Species 11, tropical W Africa; sthn trop. Afr. 1: *Calpocalyx dinklagei* Harms (=*C. crawfordianus* Mendes), Angola.

Calpurnia E.Mey.

(Papilionoideae—Sophoreae)

White: 146 (1962) as *Calpurnea*; Hillcoat: 382 (1966); Polhill: 46 (1971b); Drummond: 217 (1972); Lock: 473 (1989); Beaumont *et al.*: 5 (1999); Coates Palgrave: 354 (2002).

Sthn trop. Afr. 1: *Calpurnia aurea* (Aiton) Benth., Angola, Zambia, Zimbabwe, and sthn Afr.

Camoensia Welw. ex Benth.

(Papilionoideae—Sophoreae)

Bentham: 557 (1865); Baker: 251 (1871); Baker: 133 (1928) as *Camoensis*; Baker: 602 (1929); Toussaint: 33 (1953); Hillcoat: 380 (1966); Lock: 474 (1989).

Climbing shrubs or lianes. **Leaves** digitately trifoliolate; leaflets petiolulate, often stipellate. **Inflorescences** axillary racemes; bracts and bracteoles short, caducous. **Flowers** showy, articulated below pedicel. **Calyx** turbinate; lobes 5, deltoid or lanceolate, upper 2 ± connate. **Petals** all free; vexillum orbicular; wings and carina ovate. **Stamens** 10 or 11; filaments fused at least towards base into a tube with free portions recurved in bud; anthers uniform, linear, dorsifixed. **Ovary** sericeous, stipitate; stipe laterally fused to receptacle in lower part; ovules many; style filiform, involute in bud; stigma terminal, capitate, small. **Pod** broadly linear to oblong, flattened, few-seeded, coriaceous, dehiscent into 2 valves; base of style persistent. **Seeds** ± rhombic, flattened.

Species 2, tropical W African coast; sthn trop. Afr. 2, Angola.

Canavalia DC.

(Papilionoideae—Phaseoleae—Diocleinae)

Torre: 255 (1966); Lock: 389 (1989); Polhill: 36 (2001).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cassia L. emend. Gaertn.

(Caesalpinioideae—Cassieae)

Mendonça & Torre: 174 (1956); White: 119 (1962); Brenan: 47 (1967); Lock: 334 (1988); Lock: 27 (1989); Luckow: 195 (1996); White *et al.*: 306 (2001); Coates Palgrave: 339 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Centrosema** (DC.) Benth.

(Papilionoideae—Phaseoleae—Phaseolinae)

Bentham: 53 (1837); Torre: 281 (1966); Lock: 390 (1989); Mackinder: 32 (2001).

Climbing herbs or subshrubs. **Leaves** pinnately 3-foliolate; stipules small, striate; stipels present. **Inflorescences** (1)few–many-flowered, falsely racemose; bracts paired, striate; bracteoles appressed to calyx, striate. **Calyx** 5-lobed, upper pair largely joined into a bifid lip. **Corolla** showy; standard broad, with a conspicuous spur on back above claw, often pubescent outside. **Stamens**: vexillary filament free or joined to others at base. **Ovary** linear, many-ovuled; style curved, flattened and slightly widened towards terminal stigma, pubescent or bearded at apex. **Pod** linear, with 4 raised nerves or wings, dehiscent. **Seeds** variously coloured, oblong or ellipsoid, with an elliptic to linear hilum.

Species ± 45, neotropics and subtropics, a few of which are widely cultivated in the Old World as cover crops; sthn trop. Afr. 1: **Centrosema pubescens* Benth., cultivated and recorded as an escape, Angola, Zambia, Zimbabwe, Mozambique.

Chamaecrista Moench

(Caesalpinioideae—Cassieae)

Lock: 335 (1988); Lock: 30 (1989); Luckow: 195 (1996).

Cassia L. in part; Mendonça & Torre: 174 (1956) in part.

Sthn trop. Afr. 24, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Clitoria L.

(Papilionoideae—Phaseoleae—Clitoriinae)

White: 146 (1962); Torre: 279 (1966); Lock: 390 (1989); Mackinder: 34 (2001).

Sthn trop. Afr. 2: *Clitoria kaessneri* Harms, presumably indigenous, and **C. ternatea* L., widely cultivated and becoming naturalised in Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Colophospermum J.Kirk ex J.Léonard

(Caesalpinioideae—Detarieae)

Léonard: 388 (1949); Torre & Hillcoat: 239 (1956); White: 121 (1962); Lock: 47 (1989); Mapaure: 1 (1994); Léonard: 21 (1999b); Coates Palgrave: 317 (2002).

Copaifera mopane J.Kirk ex Benth.; Burtt Davy *et al.*: 37 (1958). *Hardwickia* in the sense of Breteler *et al.*: 279 (1997).

Monotypic genus: *Colophospermum mopane* (Benth.) J.Léonard, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Copaifera L.

(Caesalpinioideae—Detarieae)

Linnaeus: 557 (1762); Léonard: 391 (1949); Torre & Hillcoat: 243 (1956); White: 121 (1962); Aubréville: 132 (1968b); Lock: 47 (1989).

Trees or shrubs, containing resin. **Leaves** imparipinnate; leaflets 10–20, alternate to subopposite, elliptic to obovate-oblong, with translucent dots. **Inflorescences** borne in axils of terminal leaves, paniculate with central axis bearing ± 8 or more branches with dense, almost catkin-like spikes or spike-like racemes of small flowers. **Flowers** bisexual, distichous. **Sepals** 4, almost free, ± petaloid, hairy, subvalvate. **Petals** absent or rarely present and minute. **Stamens** ± 10, free. **Ovary** ± sessile, partly hairy; ovules 2(–4). **Pod** suborbicular, flattened, dehiscing with 2 thin to fairly thick valves which do not separate completely. **Seed** solitary, ± enveloped by a coloured arillus.

Species 30, tropical America and Africa; sthn trop. Afr. 1: *Copaifera baumiana* Harms, Angola, Zambia.

Cordyla Lour.

(Papilionoideae—Swartzieae)

White: 121 (1962); Brenan: 221 (1967); Lock: 476 (1989); White *et al.*: 307 (2001); Coates Palgrave: 351 (2002).

Sthn trop. Afr. 1: *Cordyla africana* Lour., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Craibia Harms & Dunn

(Papilionoideae—Millettieae)

Gillett: 189 (1960a); De Sousa: 166 (1962); Gillett: 146 (1971); Lock: 349 (1989); White *et al.*: 322 (2001); Coates Palgrave: 378 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Crotalaria L.

(Papilionoideae—Crotalarieae)

Torre: 6 (1962); Lock: 163 (1989); Polhill: 1 (1982); White *et al.*: 324 (2001); Bingham & Smith: 141 (2002); Coates Palgrave: 365 (2002).

Sthn trop. Afr. ± 270, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Crudia Schreber

(Caesalpinioideae—Detarieae)

Schreber: 282 (1789); Baker: 147 (1928); Léonard: 366 (1952b); Torre & Hillcoat: 236 (1956); Aubréville: 152 (1968b); Lock: 47 (1989).

Trees. **Leaves** imparipinnate; leaflets ± 7–10, alternate, entire; petiolules twisted. **Inflorescences** terminal or lateral, lax but many-flowered racemes. **Flowers** bisexual, small, arranged in 2 rows on long, slender pedicels. **Calyx**: sepals 4(5), joined at base into a short cup-shaped receptacle, imbricate, reflexed in open flower. **Petals** absent. **Stamens** 10, free, equally long, soon caducous, glabrous, exserted; filaments filiform; anthers versatile, elliptic, dehiscing longitudinally. **Ovary** on a short stipe arising on wall of receptacle, free, slightly compressed, tomentose; ovules 2–6; style filiform; stigma small, terminal. **Pod** obliquely oblong, compressed, opening by 2 coriaceous to woody valves. **Seeds** usually 1 or 2, large, orbicular or kidney-shaped.

Species ± 55, Old and New World; sthn trop. Afr. 1: *Crudia gossweileri* Baker f., Angola (Cabinda).

Cryptosepalum Benth.

(Caesalpinioideae—Detarieae)

Bentham: 584 (1865); Léonard: 485 (1952b); Duvigneaud: 236 (1956); White: 121 (1962); Brenan: 198 (1967); Lock: 9 (1989).

Unarmed subshrubs, shrubs or trees. **Leaves** paripinnate, with leaflets in 1 to many pairs; stipules linear, free, quickly falling off; leaflets sessile or subsessile, opposite, without translucent gland dots. **Flowers** arranged in more than 2 ranks in terminal or axillary many-flowered racemes; bracteoles 2, well-developed, petaloid (pink or white), opposite, valvate, completely enclosing flower buds, persistent. **Hypanthium** short, cup-shaped. **Sepals** usually small, 0–6. **Petals** (0)1(–3), well-developed and elliptic when present. **Stamens** 3–6(–8); staminodes sometimes present. **Ovary** stipitate; stipe adnate to side of hypanthium; ovules 1–5; stigma terminal, abruptly enlarged. **Pods** compressed, woody, dehiscent, glabrous; valves twisted after dehiscence, without longitudinal nerves, but upper suture with a longitudinal wing-like ridge on either side projecting in a plane at right angles to valve. **Seeds** compressed, elliptic, without areoles.

Species 11, trop. Africa; sthn trop. Afr. 3, and 4 subspecies, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Cullen Medik.

(Papilionoideae—Psoraleeae)

Stirton: 317 (1981); Lock: 453 (1989); Verdcourt: 43 (2000).

Psoralea in sense of Torre in part: 83 (1962).

Sthn trop. Afr. 1: *Cullen obtusifolia* (DC.) Stirton, Angola, Zimbabwe, and sthn Afr.

Cyamopsis DC.

(Papilionoideae—Indigofereae)

Gillett: 6 (1958); Torre: 84 (1962); Gonçalves: 73 (1981); Lock: 289 (1989).

Sthn trop. Afr. 1: *Cyamopsis dentata* (N.E.Br.) Torre, Angola, and sthn Afr.

Cyclocarpa Afzel. ex Baker

(Papilionoideae—Aeschynomeneae—Aeschynomeninae)

Baker: 151 (1871); Verdcourt: 406 (1971b); Verdcourt: 444 (1974); Lock: 111 (1989); Verdcourt: 157 (2000).

Erect or spreading annual herbs, mostly branched and tufted. **Leaves** alternate, sensitive, paripinnate; stipules membranous, spurred; stipels absent. **Inflorescences** umbel-like racemes, 1–4-flowered; bracts and bracteoles small, thin. **Flowers** small, yellow. **Calyx** deciduous, 2-lipped, lips almost entire. **Corolla**: standard obovate, emarginate, shortly clawed; wings oblong, shortly clawed, finely denticulate above, marked with a few small pockets; keel obtuse, spurred, finely denticulate above. **Stamens** all joined, tube split completely unilaterally or for half its length to form 2 bundles of 5, or with vexillary filament free; anthers uniform. **Ovary** linear, falcate, subsessile, many-ovuled; style curved, inflexed; stigma small, terminal. **Pods** narrow, compressed, coiled into a ring or a spiral, minutely roughened on margins; articles 8–11, separating, nerve persistent after they have fallen. **Seeds** broadly irregularly reniform; hilum minute, excentric.

Monotypic genus: *Cyclocarpa stellaris* Baker, Old World tropics; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique.

Cynometra L.

(Caesalpinioideae—Detarieae)

Linnaeus: 382 (1753); Baker: 150 (1928); Léonard: 379 (1951); Léonard: 309 (1952b); Torre & Hillcoat: 244 (1956); Aubréville: 66 (1968b); Lock: 48 (1989); Lewis: 595 (1996).

Trees, rarely shrubs. **Leaves** paripinnate; leaflets 2–30, opposite, very rarely alternate, asymmetric, entire or emarginate, without translucent dots but sometimes with a large black gland on lower surface close to petiolule, secondary veins anastomosing before reaching margin. **Inflorescences** many-flowered racemes or panicles, axillary or sometimes terminal, rarely on old wood, solitary or in fascicles; bracts large or small, usually caducous. **Flowers** small, arranged in more than 2 rows, sometimes articulated at apex of pedicel; bracteoles 2, caducous. **Calyx**: receptacle short, turbinate or sometimes campanulate; sepals 4 or 5, free, imbricate, often reflexed. **Petals** 5, free, ± equal. **Stamens** (8–)10(–12), free to slightly fused at base; anthers dorsifixed, opening longitudinally. **Ovary** on a stipe arising at bottom of receptacle; ovules 1 or 2(–4); style elongated; stigma terminal. **Pod** indehiscent or dehiscent, sometimes swollen, tuberculate, sometimes compressed, smooth. **Seeds** 1 or 2 (–4), with a very short funicle, thin-walled, exareolate.

Species 70, pantropical; sthn trop. Afr. 5, Angola.

Dalbergia L.f.

(Papilionoideae—Dalbergieae)

Cronquist: 52 (1954b); White: 147 (1962); De Sousa: 344 (1966); Polhill: 95 (1971b); Lock: 235 (1989); White *et al.*: 325 (2001); Bingham & Smith: 141 (2002); Coates Palgrave: 384 (2002).

Amerimnon P.Browne; Hiern: 275 (1896).

Sthn trop. Afr. ± 30, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dalbergiella Baker f.

(Papilionoideae—Millettiae)

Baker: 127 (1928); De Sousa: 362 (1966); Polhill: 93 (1971b); Gonçalves: 76 (1981); Lock: 350 (1989); Coates Palgrave: 388 (2002).

Trees or scandent shrubs. **Leaves** alternate, imparipinnate; stipules subulate; stipels absent; leaflets mostly subopposite, unequal-sided at base. **Inflorescences** in axils of current or fallen leaves, sometimes precocious, contracted subracemose panicles; bracts narrow; bracteoles small. **Calyx** with 2 broad upper lobes joined nearly to tips and 3 smaller triangular or deltoid lower lobes. **Corolla** cream or yellowish with standard at least marked purplish or reddish; standard with well-developed claw supporting a broad blade emarginate at both ends, longer than other petals; wings free; keel-petals little shorter than wings, only slightly curved, shortly adherent on lower side. **Stamens**: vexillary stamen free; anthers dorsifixed, with a broadened connective, thecae thus turned forwards with longitudinal slits down the face. **Ovary** subsessile, with no more than about 8 ovules; style curved at base and tapering to a small stigma. **Fruit** subsessile, indehiscent, flattened and thin, ± oblong, laxly venose, l(2)-seeded. **Seeds** reniform, smooth; hilum and rim-aril small.

Species 3, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Dalhousiea Wall. ex Benth.

(Papilionoideae—Sophoreae)

Bentham: 1 (1837); Toussaint: 4 (1953); Hillcoat: 372 (1966); Lock: 474 (1989).

Scandent shrubs or lianes up to 40 m long; branches pubescent to glabrescent. **Leaves** unifoliolate, ovate-elliptic to ovate, cuneate to subcordate at base, coriaceous, glabrous above, softly silky-pubescent to glabrescent below; stipules ovate, cordate at base, caducous; stipes absent. **Inflorescences** axillary or terminal cymes, unequally dichotomous; or flowers sometimes arranged in pseudopanicles; bracts ovate to suborbicular, persistent or caducous. **Flowers** bisexual; pedicel with 2 bract-like bracteoles at apex completely enveloping flower bud. **Calyx** campanulate with 5 short, unequal ± triangular teeth. **Corolla** exserted; standard suborbicular with short claw at base, emarginated at apex; wings obliquely oblongish; keel of petals resembling wings, cohering along proximal margin. **Stamens** 10, free, subequal; anthers oblongish-linear. **Ovary** sessile, narrowing into a slightly incurved style; stigma small, capitate; ovules 2 or 3. **Pod** oblong, tapering towards both ends, flattened, coriaceous, dehiscent. **Seeds** 2 or 3, lenticular.

Species 3: 2 in India, 1: *Dalhousiea africana* S.Moore, in W trop. Africa, including Angola.

Daniellia Benn.

(Caesalpinioideae—Detarieae)

Bennett: 252 (1854); Oliver: 299 (1871); Léonard: 406 (1949); Léonard: 341 (1952b); Torre & Hillcoat: 212 (1956); Brenan: 130 (1967); Lock: 51 (1989); Bingham & Smith: 141 (2002).

Large, glabrous, unarmed, resiniferous trees. **Leaves** paripinnate; stipules inequilateral: some oval and small, others large and foliaceous, soon caducous, leaving annular leaf scars; upper surface of rachis with 2 very small glandular openings (domatia) at level of petiolules; leaflets opposite or rarely alternate, entire, usually coriaceous and with translucid dots. **Inflorescences** terminal or axillary panicles or sometimes racemes; bracts and bracteoles soon caducous. **Calyx**: receptacle narrowly funnel-shaped; sepals 4, free, imbricate, somewhat unequal, ciliolate, coloured. **Petals** 5: 2 usually large, 1 smaller and 2 very small, rarely 1 large and 4 very small. **Stamens** 10, exserted, free or usually 9 lightly connate at base, all perfect; filaments filiform, glabrous to shortly hairy in lower half, alternately long and short in bud, strongly accrescent; anthers linear-oblong, dorsifixed, longitudinally dehiscent. **Ovary** on a long accrescent stipe, ellipsoid, compressed, glabrous; ovules many, elongate, situated in upper half of ovary; style slender, exserted; stigma capitate, terminal. **Pod** stipitate, asymmetric at base, flat, 2-valved, smooth, glabrous; endocarp coriaceous, rolling up and separating from exocarp when mature. **Seed** usually solitary, compressed, suspended by a funicle dilated at hilum; testa hard, glabrous, smooth; endosperm absent; cotyledons flat.

Species 9, trop. Africa; sthn trop. Afr. 3, Angola.

Decorsea R.Vig.

(Papilionoideae—Phaseoleae—Phaseolinae)

Lock: 390 (1989); Verdcourt: 156 (2001).

Sthn trop. Afr. 1: *Decorsea schlechteri* (Harms) Verdc., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Derris Lour.

(Papilionoideae—Millettieae)

Gillett *et al.*: 73 (1971); Polhill: 265 (1971a); Lock: 351 (1989).

Sthn trop. Afr. 1: *Derris trifoliata* Lour., Mozambique, and sthn Afr.

***Desmanthus** Willd.

(Mimosoideae—Mimoseae)

Torre: 267 (1956); Baker: 811 (1930); Lock: 88 (1989).

Acuan Medik.; Hiern: 309 (1896).

Species 24, warm America; sthn trop. Afr. 1: **Desmanthus virgatus* (L.) Willd., Angola, Zimbabwe, and sthn Afr.; pantropical weed.

Desmodium Desv.

(Papilionoideae—Desmodieae—Desmodiinae)

White: 150 (1962); Launden: 217 (1966); Schubert: 451 (1971); Gonçalves: 77 (1981); Lock: 245 (1989); Verdcourt: 1 (2000).

Sthn trop. Afr. 24, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dewevrea Micheli

(Papilionoideae—Millettieae)

Micheli: 47 (1898); Baker: 109 (1928); Baker: 255 (1929); Hauman: 61 (1954b); De Sousa: 168 (1962); Lock: 351 (1989).

Tall, woody, much-branched climbers. **Leaves** imparipinnate, 2(3)-jugate, rather large; leaflets oblong-elliptic to suborbicular, shortly acuminate, glossy above, coriaceous, silvery whitish green underneath. **Inflorescences** ample, many-flowered, terminal or axillary panicles; bracts and bracteoles very small, soon deciduous. **Flowers** fragrant. **Calyx** bilabiate; lobes subequal, entire. **Corolla**: petals slightly imbricate but not joined; vexillum broadly obovate, emarginate, bicallose at base, reflexed when flower has expanded, claw short; wings broad, free; carina broad, obtuse. **Stamens** diadelphous; vexillar stamen free; anthers drooping. **Ovary** almost sessile, 3- or 4-ovulate, surrounded at base by a 10-lobed disc; style short; stigma small. **Pod** narrowly oblong, tapering gradually towards base, narrowing abruply at tip, woody at maturity and with many small, ± transverse grooves. **Seeds** 1–5, large, flattened, dark red.

Species 2, W trop. Africa; sthn trop. Afr. 1: *Dewevrea gossweileri* Baker f., Angola.

Dialium L.

(Caesalpinioideae—Cassieae)

Torre & Hillcoat: 186 (1956); Brenan: 103 (1967); Lock: 33 (1989); Coates Palgrave: 338 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Dichrostachys (A.DC.) Wight & Arn.

(Mimosoideae—Mimoseae)

Torre: 265 (1956); Brenan & Brummitt: 37 (1970); Lock: 89 (1989); Coates Palgrave: 304 (2002).

Sthn trop. Afr. 1, *Dichrostachys cinera* (L.) Wight & Arn. with 4 subspecies: subsp. *africana* Brenan & Brummitt, subsp. *forbesii* (Benth.) Brenan & Brummitt, subsp. *nyassana* (Taub.) Brenan, subsp. *Platycarpa* (Welw.) Brenan & Brummitt, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dioclea Kunth

(Papilionoideae—Phaseoleae—Diocleinae)

Kunth: 342 (1824); Baker: 116 (1928); Robyns: 141 (1954); Hepper: 574 (1958); Torre: 254 (1966); Lock: 391 (1989).

Climbing shrubs; branches with long yellowish grey hairs. **Leaves** pinnately 3-foliolate; leaflets ovate-elliptic, rounded at base, abruptly acuminate and mucronate, thinly pilose, with 7 or 8 lateral veins on each side; stipules peltate, acute; stipels filiform. **Inflorescences** stiff, woody, noded racemes longer than leaves; bracts narrowly lanceolate. **Calyx** rusty-pubescent, with 2 upper teeth connate, lateral 2 slightly shorter than lowest one. **Corolla**: vexillum orbicular, reflexed, auriculate at base; wings obovate or oblong, free; carina incurved, subrostrate. **Stamens** 10, monadelphous but vexillary one free only at base; alternate anthers small and abortive. **Ovary** subsessile, adpressed-pubescent; ovules many; style incurved, glabrous, dilated upwards; stigma terminal, truncate, glabrous. **Pod** linear-oblong to ovate-oblong, compressed, pilose, rather woody, septate between seeds, upper suture dilated, dehiscing by 2 valves. **Seeds** 1–4, semi-orbicular; hilum conspicuous, narrow, encircling seed for up to $^3/_4$ of its circumference.

Species ± 30, tropical America, a few in Old World; sthn trop. Afr. 1: *Dioclea reflexa* Hook.f., Angola.

Dolichos L.

(Papilionoideae—Phaseoleae—Phaseolinae)

Torre: 281 (1966); Lock: 391 (1989); Germishuizen: 233 (2002).

Sthn trop. Afr. 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Droogmansia De Wild.

(Papilionoideae—Desmodieae—Desmodiinae)

De Wildeman: 53 (1902); Torre: 227 (1966); Verdcourt: 487 (1971b); Verdcourt: 536 (1974); Lock: 248 (1989); Verdcourt: 27 (2000); Bingham & Smith: 141 (2002).

Subshrubs or small shrubs with well-developed rootstocks. **Leaves** unifoliolate, frequently developing after flowers have appeared; petioles nearly always conspicuously winged, often so much so as to appear like a second lower leaf blade, rarely not winged; stipules striate, ciliate; stipels present. **Inflorescences** on leafy or leafless shoots, terminal or axillary, falsely racemose or paniculate; primary and secondary bracts present; bracteoles absent; flowers readily disarticulating with their pedicels. **Calyx** 5-lobed, 2-lipped; upper lip ± bifid, composed of 2 teeth connate for most of their length; lower lip prominently trifid, central lobe the longest. **Corolla** mostly medium-sized, white to purple; standard rounded, produced into a claw at base, sometimes puberulous outside when young; wings clawed, transversely rugose inside, usually shorter than other petals; keel usually as long as the standard. **Stamens**: vexillary filament free at base and apex but connate with main tube for one-third to half of its length; free parts of filaments dissimilar, 4 short and filiform, 5 much dilated, longer and pincer-shaped at insertion of anther; anthers uniform. **Intrastaminal disc** short. **Ovary** stipitate, 2–many-ovuled; style filiform but slightly stiffened, curved, glabrous above narrowed hairy apex of ovary; stigma terminal, capitate. **Pods** usually markedly stipitate (stipe often plumose), 1–several-jointed, pubescent. **Seeds** compressed-reniform; hilum minute, without appendages.

Species ± 28: 1 Indo-Chinese, the rest trop. Africa; sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Dumasia DC.

(Papilionoideae—Phaseoleae—Glycininae)

White: 151 (1962); Lock: 397 (1989); Mackinder: 58 (2001).

Sthn trop. Afr. 1: *Dunasia villosa* DC., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Duparquetia Baill.

(Caesalpinioideae—Cassieae)

Baillon: 189 (1865);Torre & Hillcoat: 174 (1956); Aubréville: 48 (1968b); Lock: 36 (1989).

Oligostemon pictus Benth.; Baker: 135 (1928).

Lianes. **Leaves** imparipinnate; leaflets opposite, in (2)3(4) pairs, petiolulate, ovate or elliptic to oblanceolate, velvety with maroon hairs, glabrescent below. **Inflorescences** erect, densely flowered, tomentose racemes; pedicels persistent. **Flowers** bisexual, irregular and resembling certain orchids. **Sepals** 4; anterior one coriaceous, partly enveloping others, of which 2 are joined. **Petals** 5; posterior 3 lanceolate, anterior 2 rudimentary. **Stamens** 4; filaments very short; anthers large, incurved, posterior 2 joined in lower half; all opening by apical pores. **Ovary** with 4 longitudinal ribs; ovules 2–4. **Pod** lanceolate-linear, flattened, acuminate, with 4 narrow wings, inside with woolly tomentum; valves recurving spirally after dehiscence.

Monotypic genus: *Duparquetia orchidacea* Baill., tropical W Africa; sthn trop. Afr.: Angola.

Elephantorrhiza Benth.

(Mimosoideae—Mimoseae)

Torre: 263 (1956); Brenan & Brummitt: 23 (1970); Lock: 90 (1989); Coates Palgrave: 308 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Eminia Taub.

(Papilionoideae—Phaseoleae—Glycininae)

Taubert: 29 (1891); Torre: 321 (1966); Pauwels: 153 (1983); Lock: 398 (1989); Mackinder: 42 (2001).

Erect or climbing herbs or subshrubs. **Leaves** pinnately 3-foliolate; stipules and stipels present. **Inflorescence** an axillary or terminal pseudoraceme; bracts and bracteoles gland-tipped. **Calyx** 4- or 5-lobed, upper lobes often connate, pubescent; lobes up to 5-toothed, each tooth gland-tipped or not. **Corolla** small; standard obovate, clawed. **Stamens**: vexillary stamen free, rest fused into a sheath. **Ovary** spindle-shaped, hirsute; style geniculate, filiform, bearded proximally, widening slightly towards bend, with a minute terminal stigma. **Pod** oblong, compressed, dehiscent, (1)2(3)-seeded. **Seeds** deep red to very dark brown, suborbicular or rectangular, with a small hilum bearing a small persistent cartilaginous funicle remnant.

Species 4, African; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique. The roots of several species contain an active amylase used by local people in the brewing of beer (Pauwels 1983: 153).

Entada Adans.

(Mimosoideae—Mimoseae)

Torre: 257 (1956); White: 91 (1962); Brenan: 13 (1970); Lock: 91 (1989); White *et al.*: 316 (2001); Coates Palgrave: 310 (2002).

Entadopsis Britton; White: 92 (1962).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Eriosema (DC.) G.Don

(Papilionoideae—Phaseoleae—Cajaninae)

Torre: 323 (1966); Verdcourt: 112 (1971a); Lock: 398 (1989).

Sthn trop. Afr. 47, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Erythrina L.

(Papilionoideae—Phaseoleae—Erythrinae)

Torre: 247 (1966); Lock: 408 (1989); Mackinder: 6 (2001); White *et al.*: 325 (2001); Coates Palgrave: 396 (2002); Germishuizen: 234 (2002).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Erythrophleum Afzel. ex G.Don

(Caesalpinioideae—Caesalpinieae)

Baker: 152 (1928) as *Erythrophloeum*; Torre & Hillcoat: 252 (1956); Burtt Davy *et al.*: 37 (1958) as *Erythrophloeum*; White: 124 (1962); Brenan: 18 (1967); Lock: 23 (1989); White *et al.*: 307 (2001); Coates Palgrave: 314 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Faidherbia A.Chev.

(Mimosoideae—Acacieae)

Lock: 79 (1989); Coates Palgrave: 303 (2002).

Acacia Mill. in part; White: 92 (1962); Ross: 83 (1979).

Monotypic genus: *Faidherbia albida* (Delile) A.Chev., widespread in tropical and subtrop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Fillaeopsis Harms

(Mimosoideae—Mimoseae)

Harms: 258 (1899); Baker: 796 (1930); Gilbert & Boutique: 216 (1952); Torre: 262 (1956); Keay: 490 (1958); Lock: 93 (1989); Villiers: 38 (1989).

Tall trees, ± glabrous; branches glabrous, reddish brown with lenticels in longitudinal lines. **Leaves** bipinnate, pinnae opposite, 1 or 2 pairs; leaflets mostly alternate, 4–8 to each pinna, ovate-elliptic, rounded at base, shortly obtusely acuminate, glabrous. **Inflorescence** very dense, very many-flowered, slender spikes paniculately arranged at ends of shoots; bracts glabrous, narrowly triangular; floral buds globose. **Flowers** bisexual, white. **Calyx** small, 5-toothed; teeth ovate, obtuse. **Petals** 5, free, ovate, acute, valvate. **Stamens** 10, free; filaments filiform, slightly enlarged towards base; anthers ellipsoid, 2-thecate with connective prolonged into a deciduous, globose apical gland. **Disc** large, cup-shaped, glandular, surrounding lower half of ovary. **Ovary** sessile, glabrous, oblong-ellipsoid; ovules 8–10; style filiform, somewhat excentric; stigma truncate to slightly cup-shaped. **Pod** dehiscent, large, oblong-elliptic, flat, sessile, base and apex round or obtuse, glabrous, densely reticulate, margins slightly thickened. **Seeds** transverse, flat, oblong, winged; funicle very long, attached at side.

Monotypic genus: *Fillaeopsis discophora* Harms, tropical W Africa; sthn trop. Afr.: Angola.

Flemingia Roxb. ex W.T.Aiton

(Papilionoideae—Phaseoleae—Cajaninae)

Lock: 413 (1989); Verdcourt: 146 (1971a); Verdcourt: 165 (2001).

Moghania J.St.-Hil.; White: 160 (1962).

Sthn trop. Afr. 1: *Flemingia grahamiana* Wight & Arn., and 2 introduced species, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Galactia P.Browne

(Papilionoideae—Phaseoleae—Diocleinae)

Torre: 254 (1966); Lock: 413 (1989); Verdcourt: 40 (2001).

Sthn trop. Afr. 1: *Galactia striata* (Jacq.) Urb. var. *villosa* (Wight & Arn.) Verde., Angola, Zimbabwe, Mozambique, and sthn Afr.

Gilbertiodendron J.Léonard

(Caesalpinioideae—Detarieae)

Léonard: 188 (1952a); Exell & Hillcoat: 202 (1956); Aubréville: 199 (1970); Liben: 47 (1970); Lock: 11 (1989).

Trees or shrubs. **Leaves** paripinnate, 2- to 8-jugate, lowest pair of leaflets smaller than others, arising very close to base of leaf; leaflets opposite, very rarely alternate, elliptic-oblong, very shortly petiolulate; stipules large or small, sometimes leaf-like, caducous or persistent, often with leaf-like, kidney-shaped appendages at base. **Inflorescences** axillary or terminal panicles or sometimes racemes, or sometimes in fascicles or solitary on old wood; bracteoles 2, valvate, enveloping floral bud. **Sepals** 5 and subequal, or 4 and with posterior one broader and 2-dentate or -fid. **Petals** 5, very unequal, posterior one much larger, showy, ± 2-lobed, borne on a channelled claw; other petals small, linear, resembling sepals. **Stamens** 7–9, free, glabrous, 3 fertile, long-exserted, 4–6 much smaller; anthers dorsifixed, opening by longitudinal slits. **Ovary** subsessile or very shortly stipitate, oblong, densely tomentose, arising at bottom of, and adnate on one side to, a very shortly cup-shaped receptacle; ovules 4 or 5. **Pod** woody, flattened, dehiscent, ± oblong with a thick suture and marked with 1–3 prominent longitudinal nerves and ± conspicuous transverse nerves. **Seeds** flattened.

Species 26, tropical W Africa; sthn trop. Afr. 3, Angola.

Gilletiodendron Vermoesen

(Caesalpinioideae—Detarieae)

Vermoesen: 85 (1923); Léonard: 400 (1951); Léonard: 283 (1952b); Torre & Hillcoat: 220 (1956); Aubréville: 71 (1970); Lock: 52 (1989).

Trees. **Leaves** impari- or paripinnate; rachis channelled; leaflets many, alternate or sometimes some opposite, asymmetric, with translucent dots; stipules linear, soon caducous **Inflorescences** many-flowered axillary or terminal panicles. **Flowers** distichous, small; receptacle very small, cup-shaped; bracteoles 2, subopposite. **Sepals** 4, free, subvalvate, unequal: 1 broader, glandular. **Petals** 5, free, equal, pubescent on inner face. **Stamens** 10, free, alternately long and short in bud; filaments arising on outer wall of a fleshy disc, forming a sleeve around stipe; anthers dorsifixed, dehiscing longitudinally. **Ovary** compressed, glabrous, on a short free stipe arising at bottom of receptacle; ovules 2–5; style filiform; stigma terminal. **Pod** dehiscent, compressed, oblique, apiculate, stipitate, dehiscing with 2 finely warty valves. **Seeds** compressed, smooth.

Species 5, trop. Africa; sthn trop. Afr. 1: *Gilletiodendron kisantuense* (De Wild.) J.Léonard, Angola.

*Gleditsia L.

(Caesalpinioideae—Caesalpinieae)

Brenan: 16 (1967); Lock: 24 (1989).

Sthn trop. Afr. 1: **Gleditsia triacanthos* L., Zambia, Zimbabwe, Mozambique, and sthn Afr., originally from America.

Gossweilerodendron Harms

(Caesalpinioideae—Detarieae)

Harms: 459 (1925); Torre & Hillcoat: 248 (1956); Aubréville: 147 (1968b); Lock: 53 (1989); Dombo *et al.*: 10 (2002).

Large trees exuding greenish brown resin. **Leaves** imparipinnate; leaflets 6–10, alternate, oblong-elliptic, obtuse to obtuse-acuminate, with translucid gland dots; petiolules sometimes slightly twisted. **Inflorescences** densely flowered spicate racemes arranged in panicles. **Flowers** bisexual, very small, on short pedicels; bracteoles reduced, not enveloping flower bud, caducous. **Receptacle** cup-shaped, very short. **Sepals** 4, imbricate, suborbicular, with translucid gland dots, margin ciliate. **Petals** absent. **Stamens** (8–)10; filaments free, hairy in lower parts; anthers small, dorsifixed, oval. **Ovary** stipitate, hairy; ovule 1. **Pod** resembling a samara with seed inside inflated end of a long papery wing with an irregular open network of veins, and a very short peduncle at other end. **Seed** 20–30 mm long.

Species 2, tropical W Africa; sthn trop. Afr. 1: *Gossweilerodendron balsamiferum* (Vermoesen) Harms, Angola.

Griffonia Baill.

(Caesalpinioideae—Cercideae)

Baillon: 188 (1865); Torre & Hillcoat: 200 (1956); Aubréville: 19 (1970); Lock: 43 (1989).

Bandeiraea Welw. ex Benth.; Baker: 139 (1928).

Lianes; branches puberulent, blackish. **Leaves** simple, 3-veined from base, ovate to ovate-elliptic, glabrous; petiole glabrous to puberulent. **Inflorescences** many-flowered racemes arranged in panicles. **Flowers** bisexual, regular, tomentellose to glabrescent. **Receptacle** narrowly cylindric, widening towards top. **Calyx**: tube short, ending in 5 broadly triangular lobes. **Petals** 5, equal, oblanceolate, glabrous outside, puberulent inside. **Stamens** 10, free, in 2 whorls; filaments filiform, white, puberulent; anthers black, dehiscing longitudinally. **Ovary** on long glabrous stipe, arising high in receptacle tube, glabrous; ovules ?1 or 2. **Pod** oblong-elliptic, swollen, borne on a much lengthened pedicel exserted from persistent, narrowly funnel-shaped receptacle and calyx. **Seeds** 1 or 2, subglobose.

Species 4, tropical W Africa; sthn trop. Afr. 1: *Griffonia speciosa* (Welw. ex Benth.) Taub., Angola.

Guibourtia Benn.

(Caesalpinioideae—Detarieae)

Léonard: 400 (1949); Torre & Hillcoat: 240 (1956); Brenan: 136 (1967); Coates Palgrave: 318 (2002).

Copaifera L. in part; Baker: 149 (1928).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Haematoxylum L.

(Caesalpinioideae—Caesalpinieae)

Baker: 135 (1928) as *Haematoxylon*; Torre & Hillcoat: 173 (1956); Lock: 24 (1989).

Sthn trop. Afr. 1: *Haematoxylum campechianum* L., Angola, and sthn Afr.

Hoffmannseggia Cav.

(Caesalpinioideae—Caesalpinieae)

Brummitt & Ross: 415 (1974); Lock: 24 (1989).

Sthn trop. Afr. 1: *Hoffmannseggia burchellii* (DC.) Oliv. with 2 subspecies, Zimbabwe, and sthn Afr.

Humularia P.A.Duvign.

(Papilionoideae—Aeschynomeneae—Aeschynomeninae)

Duvigneau: 151, 154 (1954); Torre: 209 (1966); Verdcourt: 429 (1971b); Verdcourt: 474 (1974); Lock: 111 (1989); Verdcourt: 140 (2000); Bingham & Smith: 141 (2002).

Geissaspis in sense of many authors, not of Wight & Arn.; Baker: 111 (1928) as *Geisaspis*.

Erect or prostrate subshrubs or less often small shrubs. **Leaves** pinnately 2–12-foliolate, leaflets asymmetrical at base, often with one part cuneiform and the other rounded or half-cordate, main nerve eccentric or even marginal; stipules rounded, cordate or unequally auriculate at base, often similar in size to leaves, leafy or sometimes submembranous or subscarious, persistent or deciduous; stipels absent. **Inflorescences** axillary or terminal, in subcylindrical bracteate racemes, generally dense and scorpioid, less often lax and zigzag; bracts big, distichous, bilobed, densely imbricate, sometimes ± hiding flowers and completely hiding fruits, mostly membranous and coloured; bracteoles membranous, persistent, nervose. **Calyx** 2-lipped, lips almost free, upper ± bifid, lower trifid. **Corolla** small or medium-sized, yellow, orange or reddish, often lined with red; standard ± pandurate, narrowed into a claw; wings spathulate, united by their basal appendages, and with a series of small pockets; keel-petals obovate, very shortly joined near apex, narrowed into a claw. **Stamens** arranged in 2 bundles of 5; anthers uniform. **Ovary** stipitate, 2-ovuled; style inflexed, glabrous; stigma terminal. **Pods** somewhat woody, flattened or eventually biconvex, 1- or 2-jointed, straight or one joint folded back on the other, often beaked by the persistent style-base. **Seeds** rounded-reniform, smooth.

Species 40, trop. Africa; sthn trop. Afr. 14, Angola, Zambia, Malawi.

Hymenaea L.

(Caesalpinioidcae—Detarieae)

Linnaeus: 1192 (1753); Langenheim & Lee: 3 (1974); Lock: 54 (1989); Coates Palgrave: 319 (2002).

Trachylobium Hayne; Oliver: 311 (1871); Brenan: 132 (1967).

Unarmed evergreen trees; bark grey to greyish-white, smooth or rough; young branchlets puberulous to glabrous. **Leaves** with a single pair of leaflets with many pellucid gland dots. **Inflorescence** paniculate. **Flowers** white; pedicels jointed at base; bracteoles large, ± completely concealing very young flower buds, caducous before flower opens. **Receptacle** short. **Sepals** 4, imbricate (2 outer, 2 inner), densely appressed pubescent outside, silvery-silky inside. **Petals** 5: upper 3 large, clawed, lower 2 very small, or occasionally all 5 well-developed. **Stamens** 10, free. **Ovary** stipitate; style long; stigma small, capitate; ovules 4. **Pod** indehiscent, thick, woody, ± resinous-warty with a pithy endocarp, 1–3-seeded. **Seeds** ± ellipsoid, hard.

Species 16, tropical America and Africa; sthn trop. Afr. 1: *Hymenaea verrucosa* Gaertn., Mozambique.

Hymenostegia (Benth.) Harms

(Caesalpinioideae—Detarieae)

Harms: 193 (1897); Léonard: 433 (1951); Torre & Hillcoat: 245 (1956); Aubréville: 97 (1968b); Lock: 55 (1989).

Trees or shrubs; buds in cones of imbricate scales which remain some time at base of shoot or inflorescence. **Leaves** paripinnate; leaflets opposite, in few to many pairs, usually sessile, sometimes subsessile, usually asymmetric, especially at base. **Inflorescences** axillary racemes, rarely panicles; 1 bract at base of pedicel persistent or not; bracteoles membranous, petaloid, often coloured, persistent, arising at base of calyx, sometimes enveloping bud, not valvate. **Flowers** bisexual, with a short cup-shaped or tubular receptacle. **Sepals** 4, imbricate, arising on rim of receptacle. **Petals** unequal, usually 3 large ones, sometimes fewer, often with 1 or 2 minute additional ones or absent. **Stamens** usually 10; filaments filiform. **Ovary** stipitate, arising on receptacle wall; ovules 2(3). **Pod** stipitate, apiculate, flat, dehiscent with 2 woody valves coiling up.

Species 16, tropical W Africa; sthn trop. Afr. 1: *Hymenostegia laxiflora* (Benth.) Harms, Angola.

Icuria Wieringa

(Caesalpinioideae—Detarieae; Macrolobieae fide Wieringa [1999])

Wieringa: 241 (1999); Gervais & Bruneau: 31 (2002); Izidine & Bandeira: 50, 55 (2002).

Tall trees; trunk straight, cylindric, without buttresses; bark pale grey. **Leaves** paripinnate, 1- or 2-jugate; leaflets opposite, never emarginate; basal leaflet with glands only in proximal half; stipules free, valvate in bud. **Inflorescences** compound racemes, axillary on terminal node, 1 per node; bracts early caducous, pubescent outside, glabrous inside. **Flowers** sometimes unisexual by reduction. **Sepals** 1 or absent, only abaxial sepal sometimes present and then fused to the bracteoles. **Petals** usually absent, rarely a vestigial lateral petal present. **Stamens** 6–8, all shortly fused at base; anthers relatively large, purple-pink, without dorsal teeth, dorsifixed. **Ovary** shortly stalked, velvety; ovules 1–3; style insertion excentric, style usually geniculate at base and near apex; stigma ± mushroom-shaped. **Pod** laterally flattened, distinctly beaked, puberulous to velvety; lateral nerve running above middle of pod; wings of upper suture narrow. **Seeds** with a very thin membranous testa.

Monotypic genus: *Icuria dunensis* Wieringa, known only from coastal dunes in Mozambique.

Indigastrum Jaub. & Spach

(Papilionoideae—Indigofereae)

Jaubert & Spach: 101, t. 492 (1857); Schrire: 165 (1992); Schrire: 219 (1995).

Indigofera in part; Polhill: 291 (1981); Lock: 289 (1989).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Indigofera L.

(Papilionoideae—Indigofereae)

Gillett: 8 (1958); Torre: 84 (1962); White: 153 (1962); Gillett: 212 (1971); Lock: 289 (1989); Schrire: 153 (1997); Schrire: 651 (1998); Schrire & Onana: 219 (2000); Bingham & Smith: 142 (2002); Coates Palgrave: 367 (2002).

Sthn trop. Afr. 165, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Isoberlinia Craib & Stapf ex Holland

(Caesalpinioideae—Detarieae)

Holland: 266 (1911); Hauman: 376 (1952b); Torre & Hillcoat: 204 (1956); Brenan: 138 (1967); Lock: 14 (1989).

Unarmed trees. **Leaves** paripinnate; stipules intrapetiolar, connate, or free in their upper part; leaflets opposite or subopposite, in 2–5 pairs, petiolulate, ±unequal-sided at base, without translucent gland dots. **Inflorescence** normally paniculate; branches racemose or paniculate; bracteoles 2, well-developed, valvate, completely enclosing flower buds, persistent. **Hypanthium** tubular, 2.5–8 mm long. **Sepals** (4)5(–7), subequal. **Petals** 5(6); usually all well-developed, but upper one always somewhat longer or wider than others and often of a different shape. **Stamens** 10(–14); filaments free, exserted. **Ovary** sessile to shortly stipitate, and arising on tube of hypanthium; ovules 4–8. **Pod** dehiscing elastically or explosively into 2 flattened, smooth or sometimes obliquely-nerved woody valves; upper suture not at all winged. **Seeds** compressed, ± obovate-elliptic, with thin testa and short funicle.

Species 5, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Malawi.

Julbernardia Pellegr.

(Caesalpinioideae—Amherstieae)

Torre & Hillcoat: 210 (1956); Brenan: 145 (1967); Lock: 15 (1989); Coates Palgrave: 331 (2002).

Pseudoberlinia Duvign.; White: 128 (1962).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Kotschya Endl.

(Papilionoideae—Aeschynomeneae—Aeschynomeninae)

White: 156 (1962); Torre: 205 (1966); Verdcourt: 447 (1974); Lock: 115 (1989); Verdcourt: 117 (2000); White *et al.*: 327 (2001); Bingham & Smith: 142 (2002).

Damapana Adans.; Hiern: 236 (1896). *Smithia* Aiton in large part; Baker: 302 (1929).

Sthn trop. Afr. 21, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lablab Adans.

(Papilionoideae—Phaseoleae—Phaseolinae)

Torre: 302 (1966); Lock: 414 (1989); Verdcourt: 80 (2001).

Sthn trop. Afr. 1: *Lablab purpureus* (L.) Sweet, with 3 subspecies which are widely cultivated, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Leptoderris Dunn

(Papilionoideae—Millettiae)

Dunn: 387 (1910); Baker: 130 (1928); Hauman: 32 (1954b); De Sousa: 368 (1966); Polhill: 76 (1971b); Lock: 351 (1989); White *et al.*: 328 (2001).

?*Deguelia* sensu Hiern: 282 (1896).

Woody climbers, less commonly erect to scandent shrubs or trees with slender liane-like branches. **Leaves** imparipinnate; stipules present, usually caducous; stipels usually present, sometimes lacking; leaflets opposite. **Flowers** fairly small, crowded on very short ultimate branches of the mostly large terminal and axillary panicles (terminal panicles at least usually well branched); bracts subtending panicle branches mostly similar to stipules; floral bracts small; pedicels short with small mostly caducous bracteoles at top. **Calyx** narrowly campanulate, small, shortly 5-toothed with the 2 upper teeth united practically to the tips, hairy on both surfaces. **Corolla** usually white, cream or pale yellowish, often marked red, pink or violet; petals narrow, subequal in length or wings a little shorter, often auriculate at base of blade, glabrous to sparsely hairy or ciliolate at tips; standard narrowly oblong or oblanceolate, with incurved margins, with or without thickenings at base of blade; wings adhering to keel-petals and often with a distinct lateral fold or pocket; keel-petals oblong-elliptic, a little more curved and lightly coherent towards tips on lower side. **Stamens** united into a tube generally closed above but with openings at base either side of vexillary stamen (the latter may be free in young bud and is often adnate to claw of standard); anthers dorsifixed. **Ovary** shortly stipitate, few-ovulate; style curved, tapering to a very small terminal stigma, glabrous or with scattered hairs like those of ovary on lower part. **Fruits** flattened, indehiscent, elliptic to linear-oblong, with or more rarely without a relatively narrow wing along upper edge, papery, usually venose, 1–few-seeded. **Seeds** reniform, usually finely wrinkled, with a small hilum; rim-aril detaching with rather persistent funicle.

Species 18, trop. Africa; sthn trop. Afr. 7, Angola, Zambia, Malawi.

Lessertia DC.

(Papilionoideae—Galegeae—Coluteinae)

De Sousa: 186 (1962); Lock: 261 (1989).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, and sthn Afr.

***Leucaena** Benth.

(Mimosoideae—Mimoseae)

Torre: 268 (1956); Brenan & Brummitt: 53 (1970); Lock: 93 (1989).

Sthn trop. Afr. 1: **Leucaena leucocephala* (Lam.) De Wit, widely cultivated,

and naturalised in some areas, also in sthn Afr.

Leucomphalos Benth. ex Planch.

(Papilionoideae—Sophoreae)

Planchon: t. 784 (1848); Baker: 591 (1929) as *Leucomphalus*; Hepper: 511 (1958); Hallé: 847 (1965); Lock: 475 (1989); Brummitt (Unpublished).

Shrubs or small trees. **Leaves** 1-foliolate, ovate-elliptic, rounded at base, obtusely acuminate, papery, glabrous, closely reticulate on both surfaces, with ± 6 pairs of lateral nerves; petiole long, subterete; stipules inconspicuous. **Inflorescences** short axillary racemes towards ends of branches; axis of inflorescence pubescent; pedicels puberulous; buds ovoid, glabrous; bracts and bracteoles small. **Calyx** ovoid, shortly toothed, membranous, slitting down to base on one side as flower expands. **Petals** subequal; vexillum subsessile, broadly ovate; wings linear-oblong. **Stamens** free; anthers linear, longer than filaments. **Ovary** long-stalked; ovules few; style subulate; stigma small, terminal. **Pod** long-stalked, dehiscent, obliquely elliptic, beaked, coriaceous, turgid, 2-valved, 1(2)-seeded. **Seed** with a spongy aril.

Monotypic genus: *Leucomphalos capparideus* Benth. ex Planch., W trop. Africa; sthn trop. Afr.: Angola.

Librevillea Hoyle

(Caesalpinioideae—Detarieae)

Hoyle: 17 (1955); Torre & Hillcoat: 234 (1956); Hoyle: 149 (1958); Aubréville: 283 (1968b); Lock: 57 (1989).

Trees. **Leaves** pinnate; leaflets 3–6, alternate, ovate-oblong or lanceolate with attenuate, acuminate apex, obtuse to rounded base, slightly falcate, glabrous, coriaceous; stipules intrapetiolar. **Inflorescences** fairly open terminal panicles; pedicels puberulous; bracteoles sepaloid, suborbicular, puberulous. **Receptacle** short, cupular. **Perianth** rudimentary with (1)2 minute tepals. **Stamens** 10; filaments filiform, fused at base. **Ovary** shortly stipitate, hairy; ovules 2(3). **Pod** dehiscing with 2 woody valves.

Monotypic genus: *Librevillea klainei* (Harms) Hoyle, Gabon; Angola.

Lotononis (DC.) Eckl. & Zeyh.

(Papilionoideae—Crotalarieae)

Torre: 3 (1962); Lock: 214 (1989); Van Wyk: 1 (1991).

Listia E.Mey.; White: 158 (1962); Drummond: 223 (1972).

Sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lotus L.

(Papilionoideae—Loteae)

Torre: 81 (1962); Lock: 342 (1989).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Machaerium Pers.

(Papilionoideae—Dalbergieae)

Persoon: 276 (1807); Lock: 241 (1989).

Drepanocarpus G.Mey.; Baker: 128 (1928); Hauman: 14 (1954b); De Sousa: 356 (1966).

Shrubs or small trees with firm glabrous branches with pairs of sharp, recurved stipular spines. **Leaves** imparipinnate, 5–9-foliolate; leaflets opposite or subopposite, short-stalked, oblong-elliptic, rounded at each end, minutely pubescent beneath, pitted above, with ± 25 pairs of fine secondary nerves and a thick margin. **Inflorescence** axillary and terminal, sparsely branched panicles. **Calyx** campanulate, glabrous; teeth short, deltoid, subequal. **Corolla**: standard broadly ovate or orbicular; wings oblong, often falcate; keel incurved, keel petals connate at back. **Stamens** monadelphous or vexillar one free; anthers dorsifixed. **Ovary** short-stalked; ovules 1 or 2; style incurved, filiform; stigma terminal, very small. **Pod** strongly falcate to curved so that point touches base, indehiscent, flattened, coriaceous, 1-seeded; upper suture prominent, lower one much arched. **Seeds** reniform, flattened.

Species 120, tropical America; 1: *Machaerium lunatum* (L.f.) Ducke, extending to W African coast, including Angola.

***Macroptilium** (Benth.) Urb.

(Papilionoideae—Phaseoleae—Phaseolinae)

Urban: 457 (1928); Lock: 415 (1989) as *Macroptilum*; Polhill: 159 (2001).

Herbs, prostrate or twining. **Leaves** pinnately 3-foliolate; stipules subpersistent, not prolonged below point of insertion, striate; stipels present. **Inflorescences** axillary, falsely racemose, long-pedunculate, flowers in fascicles along rachis which is swollen at insertion of pedicels; bracts and bracteoles present, deciduous or ± persistent. **Flowers** usually fairly small, white or red to blackish purple. **Calyx** 5-lobed; upper lobes joined higher. **Petals**: standard broad, reflexed, without appendages; wings broadly rounded; keel with a long claw adnate to staminal sheath, blade rather narrow, elongated, apex beaked and forming a spiral of 270°, shorter than wings. **Stamens**: vexillary stamen free; anthers uniform. **Ovary** linear, with many ovules; style tenuous below, filiform and flexible, apical part cartilaginous and thickened, abruptly curved through 90° just above its junction with the tenuous part, narrowed and slightly curved towards apex, resembling a squarish hook, hairy inside towards the terminal stigma. **Pods** long and narrow, many-seeded. **Seeds** small, with a short hilum.

Species ± 20, America, 2 widely cultivated; sthn trop. Afr. 1: **Macroptilium atropurpureum* (Moç. & Sessé ex DC.) Urb., Zimbabwe.

Macrotyloma (Wight & Arn.) Verdc.

(Papilionoideae—Phaseoleae—Phaseolinae)

Lock: 415 (1989); Mackinder: 104 (2001).

Dolichos L. in part; Baker: 444 (1929).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Medicago** L.

(Papilionoideae—Trifolieae)

Drummond: 224 (1972).

Sthn trop. Afr. 2, widely cultivated and often naturalised; also in sthn Afr.

*Melilotus Mill.

(Papilionoideae—Trifolieae)

Drummond: 224 (1972).

Sthn trop. Afr. 2, widely cultivated and often naturalised; also in sthn Afr.

Microcharis Benth.

(Papilionoideae—Indigofereae)

Schrire: 165 (1992); Schrire: 161 (1995).

Indigofera in part; Lock: 289 (1989).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Millettia Wight & Arn.

(Papilionoideae—Millettieae)

De Sousa: 170 (1962); Gillett: 122 (1971); Polhill: 260 (1971a); Lock: 355 (1989); White *et al.*: 328 (2001); Coates Palgrave: 376 (2002).

Sthn trop. Afr. 26, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mimosa L.

(Mimosoideae—Mimoseae)

Torre: 268 (1956); Brenan & Brummitt: 47 (1970); Lock: 93 (1989).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mucuna Adans.

(Papilionoideae—Phaseoleae—Erythrinae)

Torre: 250 (1966); Lock: 417 (1989); Verdcourt: 14 (2001); White *et al.*: 330 (2001).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mundulea (DC.) Benth.

(Papilionoideae—Millettieae)

De Sousa: 169 (1962); Gillett: 155 (1971); Lock: 364 (1989); Coates Palgrave: 376 (2002).

Sthn trop. Afr. 1: *Mundulea sericea* (Willd.) A.Chev., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Neonotonia J.A.Lackey

(Papilionoideae—Phaseoleae—Glycininae)

Mackinder: 54 (2001).

Glycine Willd. in part; Torre: 241 (1966); Lock: 414 (1989).

Sthn trop. Afr. 1: *Neonotonia wightii* (Wight & Arn.) Lackey, with 3 subspecies, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Neorautanenia Schinz

(Papilionoideae—Phaseoleae—Phaseolinae)

Torre: 296 (1966); Lock: 418 (1989); Verdcourt: 74 (2001); Germishuizen: 235 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Neptunia Lour.

(Mimosoideae—Mimoseae)

Torre: 267 (1956); Brenan & Brummitt: 45 (1970); Lock: 94 (1989).

Sthn trop. Afr. 1: *Neptunia oleracea* Lour., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Nesphostylis Verdc.

(Papilionoideae—Phaseoleae—Phaseolinae)

Verdcourt: 296, fig. 3 (1970a); Lock: 419 (1989); Mackinder: 74 (2001).

Sphenostylis E.Mey. in part; Torre: 275 (1966).

Perennial climbing herbs. **Leaves** pinnately 3-foliolate; stipules small, striate; stipels present. **Inflorescences** axillary; flowers solitary. **Calyx** 5-lobed, but upper lobes connate. **Corolla** large, blue or pale purple; standard glabrous, auriculate and with appendages at base. **Stamens**: vexillary stamen free, with a tooth-like appendage at base; filaments dilated at apex; anthers similar in size, but 5 basifixed and 5 subdorsifixed. **Ovary** linear, many-ovuled; tomentose; style slightly twisted, flattening into a wedge shape at apex, with a ring of hairs directly below terminal stigma. **Pods** linear, compressed, many-seeded. **Seeds** oblong, with a well-developed aril.

Species 3, one each in trop. Africa, India and Burma; sthn trop. Afr. 1: *Nesphostylis holosericea* (Welw. ex Baker) Verdc., Angola, Mozambique. *N. junodii* (Harms) Munyenyembe & Bisby is included under *Dolichos*.

Newtonia Baill.

(Mimosoideae—Mimoseae)

Torre: 261 (1956); Brenan & Brummitt: 28 (1970); Lock: 94 (1989); Villiers: 119 (1990); White *et al.*: 317 (2001); Coates Palgrave: 306 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Normandiodendron J.Léonard

(Caesalpinioideae—Detarieae)

Léonard: 446 (1993).

Leonardoxa Aubrév.: 178 (1968a) in part; Aubréville: 81 (1968b); Lock: 56 (1989). *Schotia* Jacq. in part; Torre & Hillcoat: 221 (1956).

Trees or shrubs. **Leaves** paripinnate with 2–4 pairs of usually opposite, elliptic to lanceolate, asymmetric, entire leaflets. **Inflorescences** short, dense racemes, axillary or on old wood, solitary or 2 or 3 together; bracts and bracteoles ovate, short, caducous. **Calyx** tubular, with 4 broad, imbricate lobes, reflexed in open flower. **Petals** 5, subequal. **Stamens** 10; filaments long-exserted, somewhat unequal, sometimes slightly fused at base. **Ovary** stipitate with stipe fused with calyx tube up to rim; ovules 4 or 5. **Pod** elliptic to oblong, flattened, smooth, lightly veined.

Species 2, trop. African forest; sthn trop. Afr. 1: *Normandiodendron bequaertii* (De Wild.) J.Léonard, Angola.

Oddoniodendron De Wild.

(Caesalpinioideae—Detarieae)

De Wildeman: 22 (1925); Mendes: 161 (1963); Aubréville: 260 (1968b); Lock: 18 (1989).

Trees, ± 20 m high; branches and leaves glabrous. **Leaves** alternate, imparipinnate, (1)2, 3(4)-foliolate; leaflets alternate, narrowly elliptic-lanceolate to subfalcate, gradually acuminate; base asymmetric, rounded to broadly cuneate; stipules fused to form a persistent callus bidentate at apex. **Inflorescences**: panicles or rarely racemes, usually axillary and fascicled or sometimes solitary; bracteoles densely reddish pubescent outside. **Flowers** with a short receptacle. **Sepals** 4, pilose inside. **Petals** 5, subequal. **Stamens** (8)10, long-exserted; filaments glabrous. **Ovary** shortly stipitate, hirsute; stipe and style glabrous; ovules 4–6. **Pod** dehiscent with 2 woody valves coiling after dehiscence.

Species 2, tropical W Africa; sthn trop. Afr. 1: *Oddoniodendron romeroi* Mendes, Angola.

Ophrestia H.M.L.Forbes

(Papilionoideae—Phaseoleae—Ophrestiinae)

Lock: 419 (1989); Verdcourt: 24 (2001); Bingham & Smith: 142 (2002).

Glycine sensu Baker f.: 114 (1928). *Paraglycine* F.J.Herm.; Torre: 243 (1966).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Ormocarpum P.Beauv.

(Papilionoideae—Aeschynomeneae—Ormocarpinae)

Torre: 190 (1966); Gillett: 352 (1971); Verdcourt: 361 (1974); Gonçalves: 99 (1981); Lock: 118 (1989); Verdcourt: 51 (2000); Coates Palgrave: 381 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Otholobium C.H.Stirt.

(Papilionoideae—Psoraleeae)

Stirton: 1 (1986); Lock: 454 (1989);Verdcourt: 46 (2000); White *et al.*: 332 (2001); Coates Palgrave: 372 (2002).

Sthn trop. Afr. 1: *Otholobium foliosum* (Oliv.) C.H.Stirt., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Otoptera DC.

(Papilionoideae—Phaseoleae—Phaseolinae)

Lock: 420 (1989); Verdcourt: 66 (2001).

Sthn trop. Afr. 1: *Otoptera burchellii* DC., Zimbabwe, and sthn Afr.

Oxystigma Harms

(Caesalpinioideae—Detarieae)

Harms: 195 (1897); Léonard: 369 (1952b); Torre & Hillcoat: 246 (1956); Aubréville: 128 (1968b); Lock: 57 (1989).

Pterygopodium Harms; Baker: 152 (1928).

Trees with resinous wood. **Leaves** pari- or imparipinnate; leaflets (2–)4–6(–9), alternate or opposite, petiolulate, elliptic to lanceolate, entire, coriaceous, with translucent dots. **Inflorescence** with flowers crowded into dense, narrowly cylindric spikes arranged in open, axillary or terminal open panicles, or spikes sometimes solitary or fascicled. **Flowers** small, shortly pedicelled; bracts and bracteoles very small, caducous. **Sepals** 5(6), imbricate, ± free, orbicular. **Petals** absent. **Stamens** (8–)10, exserted; filaments free; equally long, accrescent, pubescent in lower half; anthers dorsifixed, small. **Ovary** sessile; ovule 1(?2). **Pod** suborbicular, asymmetric, flattened, woody, smooth. **Seed** 1, ruminate or pitted, resinous.

Species 5, trop. Africa; sthn trop. Afr. 2, Angola.

Paramacrolobium J.Léonard

(Caesalpinioideae—Detarieae)

Léonard: 348 (1954a); Exell & Hillcoat: 200 (1956); Brenan: 155 (1967); Lock: 18 (1989).

Unarmed evergreen trees. **Leaves** paripinnate; stipules connate into a ± elongate, persistent, intrapetiolar scale which is biapiculate to rounded at apex; petiolules twisted; leaflets opposite, in 2–5 pairs, petiolulate, unequal-sided at base, without translucent gland dots. **Flowers** in compact terminal corymbose panicles; bracteoles 2, well-developed, valvate, completely enclosing flower buds, persistent. **Hypanthium** shortly cup-shaped. **Sepals** 4, unequal, posterior one larger than others and 2-toothed at apex. **Petals** 5, bluish-mauve; upper one relatively very large, 2 lateral ones much smaller, 2 lower ones minute. **Stamens** 9, their filaments unequally connate at base; normally 3 anterior ones large, well-developed, fertile, and 6 posterior ones reduced, staminodial. **Ovary** long-stipitate, tomentellous; ovules ± 6–8; style elongate, glabrous above; stigma abruptly enlarged, reniform-peltate. **Pod** dehiscing (initially at least along upper suture only) into 2 flattened woody valves without obvious transverse nerves; upper suture with a narrow wing-like ridge along each side. **Seeds** large, hard, ± compressed, on short funicles; each side marked with a large areole whose continuous margin is a small but abrupt change in level of surface of seed (areole being slightly sunken in relation to adjacent surface).

Monotypic genus: *Paramacrolobium coeruleum* (Taub.) J.Léonard, trop. Africa; sthn trop. Afr.: Angola.

Parkia R.Br.

(Mimosoideae—Parkieae)

Brown: 234 (1826); Torre: 256 (1956); Brenan: 11 (1970); Hopkins & White: 235 (1984); Lock: 98 (1989); Villiers: 26 (1989); Luckow & Hopkins: 1300 (1995); Hopkins: 29 (1998); White *et al.*: 317 (2001).

Trees without spines or prickles. **Leaves** 2-pinnate; petiole usually glandular on its upper side; pinnae (3)4–11(–14); leaflets in 10–18(–28) pairs. **Inflorescence** capitate, shortly claviform (with a globose apical part abruptly narrowed into a ± short cylindric neck), solitary or paniculate. **Flowers** in upper part of heads bisexual, in lower part male or neuter. **Calyx** infundibuliform or long-tubular, gamosepalous, with 4 or 5 imbricate segments, 2 larger and 2 or 3 smaller, mouth of calyx therefore irregular. **Corolla** with 5 petals, free or ± united, not much longer than calyx. **Stamens** 10, all fertile; filaments connate below into a tube, to which petals are shortly adnate; anthers eglandular. **Ovary** usually stipitate. **Pods** oblong to linear, straight or curved, dehiscent or not, usually ± thick and often woody, or somewhat fleshy when living. **Seeds** ellipsoid to ellipsoid-oblong, ± compressed or flattened.

Species ± 40, widely distributed through the tropics; ± 7 species in Africa

and Madagascar, the others in Asia and America; sthn trop. Afr. 2, Angola, Zambia, Malawi, Mozambique.

*Parkinsonia L.

(Caesalpinioideae—Caesalpinieae)

Torre & Hillcoat: 174 (1956); Lock: 25 (1989); Coates Palgrave: 342 (2002).

Sthn trop. Afr. 1: **Parkinsonia aculeata* L., Angola, Zimbabwe, Mozambique, and sthn Afr.

Parochetus Buch.-Ham. ex D.Don

(Papilionoideae—Trifolieae)

Don: 240 (1825); Gillett: 1014 (1971); Thulin: 192 (1983); Lock: 489 (1989).

Prostrate herbs, rooting at nodes; stems glabrous or sparsely pilose. **Leaves** digitately 3-foliolate, with petioles up to ± 8 times as long as leaflets; leaflets cuneate-obovate, emarginate, entire or crenate or coarsely toothed distally, with ± 4 major secondary nerves on each side; stipules scarious, oval, acute, almost free from petiole, their bases forming a ring around stem. **Inflorescence** axillary, long-pedunculate, (1)2(–4)-flowered umbels; bracts present; bracteoles absent. **Calyx** 5-lobed, 2 upper lobes fused almost to tip. **Corolla** glabrous, bright blue, caducous. **Stamens**: 9 united, upper one free; filaments abruptly bent upwards through 90°, not attached to corolla; anthers uniform. **Ovary** glabrous; style bent abruptly upwards; ovules many. **Pod** linear, acute, 3–4 times as long as calyx, somewhat inflated when ripe, glabrous, not septate, tardily dehiscent, many-seeded. **Seeds** 10–15, dark, obscurely mottled, not conspicuously arillate; hilum small, circular, lateral.

Monotypic genus: *Parochetus communis* D.Don, mountains of trop. Africa and Asia to Java; sthn trop. Afr., Malawi, Mozambique.

Pearsonia Dummer

(Papilionoideae—Crotalarieae)

Lock: 228 (1989).

Gamwellia Baker f.; White: 152 (1962); Milne-Redhead: 809 (1971). *Phaenohoffmannia* Kuntze; Drummond: 225 (1972).

Sthn trop. Afr. 8, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Peltophorum (Vogel) Benth.

(Caesalpinioideae—Caesalpinieae)

Torre & Hillcoat: 169 (1956); Lock: 26 (1989); Coates Palgrave: 345 (2002).

Sthn trop. Afr. 1: *Peltophorum africanum* Sond., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pentaclethra Benth.

(Mimosoideae—Parkieae)

Bentham: 127 (1840); Oliver: 322 (1871); Gilbert & Boutique: 138 (1952); Torre: 255 (1956); Lock: 99 (1989); Villiers: 18 (1989).

Unarmed trees. **Leaves** bipinnate, without glands; pinnae in many pairs; leaflets multijugate, shiny; stipules small, subulate, deciduous. **Inflorescences** dense, many-flowered spikes often arranged in panicles towards ends of branches. **Flowers** bisexual or unisexual, or sometimes sterile, sessile. **Calyx** campanulate with 5 short broad lobes. **Petals** 5, connate below, elliptic or oblong, valvate. **Stamens** 5, alternipetalous, far exserted, anthers and staminodes with a minute apical gland; staminodes 5, epipetalous, filiform; stamens, staminodes and inner, crenate-margined disc adnate to base of united petals. **Ovary** subsessile, densely pubescent, at least in upper half; style slender; stigma obliquely capitellate, terminal; ovules ± 6 or more. **Pod** 2-valved, elongate, compressed, narrowing towards base; valves woody, elastically revolute when mature. **Seeds** compressed; without endosperm.

Species 2, tropical America, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda).

Pericopsis Thwaites

(Papilionoideae—Sophoreae)

Thwaites: 413 (1864); Hillcoat: 381 (1966); Polhill: 41 (1971b); Gonçalves: 100 (1981); Lock: 475 (1989); Coates Palgrave: 353 (2002).

Afrormosia Harms; Baker: 134 (1928); Burtt Davy *et al.*: 74 (1958); White: 143 (1962). *Ormosia* Jack; White: 161 (1962) as synonym.

Trees or less commonly large shrubs. **Leaves** (5)7–12(13)-foliolate; leaflets mostly exceeding 30 x 15 mm, usually appearing alternate but occasionally in opposite pairs; stipels generally present, single at base of lateral leaflets, paired and unequal at base of terminal one, inconspicuous and caducous. **Flowers** in terminal panicles or rarely simple racemes; bracts and bracteoles ± linear-oblong, up to 3 mm long, caducous. **Calyx** campanulate below, with 5 teeth 2–4 times as long as tube, upper 2 remaining connate for most of their length, whole calyx eventually falling as one piece. **Petals** subequal in length, 10–22 mm long; standard suborbicular with a short claw, limb usually reflexed; wings with a short claw up to 3 mm long and a well-developed auricle at base of limb; keel-petals with a claw up to 5 mm long and a well-developed auricle, free or lightly coherent along lower margin. **Stamens** free; anthers dorsifixed. **Intrastaminal disc** present. **Ovary** stipitate, sometimes shortly so, ± 2–8-ovulate; style incurved, hooked at apex, glabrous, with a small terminal stigma. **Fruit** ± flat, oblong to linear-oblong, ± winged along upper margin and generally also along lower margin, proximal part often constricted to form a false stipe, larger pods often also constricted about middle, slightly woody, indehiscent. **Seeds** flat, oblong to suborbicular, reddish; hilum small; radicle short, straight.

Species 4, 3 trop. Africa; sthn trop. Afr. 1: *Pericopsis angolensis* (Baker) Meeuwen, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

*Phaseolus L.

(Papilionoideae—Phaseoleae—Phaseolinae)

Linnaeus: 237 (1953); Torre: 260 (1966); Verdcourt: 507 (1970c); Lock: 421(1989); Verdcourt: 160 (2001).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, and sthn Afr. Widely cultivated, of American origin, frequently naturalised.

Philenoptera Fenzl ex A.Rich.

(Papilionoideae—Millettieae)

Richard: 232 (1847); Lock: 95 (2000); Schrire: 81 (2000); Coates Palgrave: 392 (2002).

Capassa Klotzsch; De Sousa: 367 (1966). *Lonchocarpus* Kunth sect. *Paniculata* Benth.; De Sousa: 363 (1966); Polhill: 260 (1971a); Polhill: 65 (1971b); Lock: 353 (1989).

Trees or shrubs; slash usually producing a blood-red, resinous exudate. **Leaves** imparipinnate; leaflets 5–15, (sub)opposite, upper ones generally larger, sometimes leaves pinnately 3–1-foliolate; leaflets with reticulate venation often prominent beneath; stipellae present. **Flowers** 7–18 mm long, scattered singly on rachis in well-developed, irregular panicles, usually borne terminally and/or in axils of fallen or current leaves; bracts shorter than corresponding buds, usually caducous; bracteoles present; hypanthium indistinct. **Calyx** campanulate or cupulate, shortly 5-toothed with upper 2 almost completely united or subtruncate. **Corolla** much longer than calyx, white, pink or purplish, sometimes with yellow markings on standard, glabrous or with scattered hairs; standard ovate, obovate or suborbicular, reflexed, auriculate and/or with indistinct to distinct callosities at base; wings adhering to keel and of subequal length, both usually obtuse; keel petals partially connate towards tip, keel sometimes slightly falcate. **Stamens** united into a tube with vexillary filament adnate to the others; basal fenestrae distinct; anthers dorsifixed. **Disc** present. **Ovary** usually shortly stipitate, few-ovulate; style curved, tapering to a very small terminal stigma, glabrous or with scattered hairs. **Pod** flattened, reticulately veined, indehiscent, broadly ovate to linear-oblong, with upper suture thin, thickened or slightly winged, usually stipitate, papery to coriaceous. **Seeds** 1–4(–8), laterally flattened, oblong-reniform, usually small; hilum and rim-aril small; radicle folded.

Species 12, trop. and sthn Africa and Madagascar; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Physostigma Balf.

(Papilionoideae—Phaseoleae—Phaseolinae)

Balfour: 310, t. 16 (1861); Torre: 259 (1966); Lock: 421 (1989); Verdcourt: 119 (2001).

Herbs or subshrubs, erect or climbing. **Leaves** pinnately 3-foliolate; stipules persistent, not spurred, ribbed; stipels persistent. **Inflorescences** either axillary on leafy stems or appearing terminal on leafless shoots, pseudoracemose, many-flowered; rachis sometimes swollen at insertion of pedicels. **Flowers** mostly showy, white to purple. **Calyx** 5-lobed, 2-lipped, lower 3 lobes ovate-triangular, upper pair of lobes united to form an entire or bifid lip. **Petals**: standard auriculate but without appendages, glabrous; keel with marked basal spur, apex beaked, spirally twisted. **Stamens**: vexillary stamen free; 5 anthers dorsifixed, alternating with 5 basifixed ones. **Ovary** linear, 2–12-ovuled; style long, incurved for over 360°, narrowed below, thickened above, longitudinally barbate near apex, furnished at apex above oblique stigma with a dorsal appendage. **Pods** linear or linear-oblong, often curved, valves sometimes twisting after dehiscence. **Seeds** large or small, ellipsoid or subcylindrical; hilum linear or elliptic to ovate; aril absent.

Species 4 or 5, several ill-defined, confined to trop. Africa; sthn trop. Afr. 2 or 3, Angola, Zambia, Malawi, Mozambique. The genus is well known for its poisonous properties.

Piliostigma Hochst.

(Caesalpinioideae—Cercideae)

Torre & Hillcoat: 199 (1956); White: 126 (1962); Lock: 44 (1989); Coates Palgrave: 337 (2002).

Sthn trop. Afr. 1: *Piliostigma thonningii* (Schumach.) Milne-Redh., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Piptadeniastrum Brenan

(Mimosoideae—Mimoseae)

Brenan: 179 (1955); Torre: 262 (1956); Brenan: 21 (1959); Verdcourt: 359 (1974); Lock: 96 (1989).

Piptadenia africana Hook.f.; Baker: 154 (1928).

Trees, tall, unarmed. **Leaves** bipinnate; pinnae 10–19(23) pairs, opposite or sometimes alternate, each pinna with 30–58(–61) pairs of linear leaflets; rachis of leaf without glands. **Flowers** bisexual, small, in often aggregated, spiciform racemes. **Calyx** gamosepalous, 5-toothed, glabrous outside except at base. **Petals** 5, free, glabrous outside, separated from base of ovary by a short perigynous zone composed of stamens and disc consolidated with an apparent corolla tube. **Stamens** 10, fertile; anthers each with a caducous apical gland. **Ovary** glabrous outside. **Pods** oblong-linear, straight or somewhat curved, flattened, dehiscing along one of the sutures with valves remaining attached lengthwise, neither splitting transversely nor into layers. **Seeds** flattened, ± oblong, elongate in direction of length of pod, surrounded by a broad membranous wing; cotyledons elongate transversely to radicle; funicle attached at or near middle of seed.

Monotypic genus: *Piptadeniastrum africanum* (Hook.f.) Brenan, C Africa; sthn trop. Afr.: Angola.

Platysepalum Welw. ex Baker

(Papilionoideae—Millettieae)

Baker: 131 (1871); Baker: 108 (1928); Baker: 251 (1929); Hauman: 63 (1954a); Gillett: 464 (1960b); De Sousa: 167 (1962); Gillett: 120 (1971); Lock: 365 (1989).

Trees, shrubs or lianes. **Leaves** imparipinnate, (2)3- or 4-jugate; leaflets opposite, petiolulate, obovate to elliptic; stipules triangular, caducous. **Inflorescences** terminal and/or axillary panicles. **Flowers** pedicellate. **Calyx** with a short campanulate tube within 2 ± persistent bracteoles; 2 upper teeth greatly enlarged and connate into a broad, emarginate, cucullate lip ± as long as corolla and almost completely hiding it; 3 lower teeth free, linear-lanceolate, shorter than upper lip, but longer than tube. **Petals**: vexillum obcordate or obovate, emarginate, shortly unguiculate; wings and carina nearly as long as vexillum. **Stamens** diadelphous with upper stamen free from base or partly joined; anthers uniform, linear-lanceolate, oblong, versatile. **Ovary** linear, pilose; ovules 5 or 6; on a short gynophore surrounded by a short, 10-toothed nectary; style filiform, incurved, ± glabrous; stigma minute, terminal. **Pod** linear-lanceolate to oblong-ovate, compressed, marginate, woody, 2-valved, softly tomentose, ultimately dehiscent. **Seeds** 2–5, suborbicular, black.

Species 7–12, moister parts of trop. Africa; sthn trop. Afr. 2, Angola, Mozambique.

***Prosopis** L.

(Mimosoideae—Mimoseae)

White: 93 (1962); Lock: 96 (1989).

Sthn trop. Afr. 1: **Prosopis limensis* Benth., introduced in Zimbabwe, and sthn Afr.

Pseudarthria Wight & Arn.

(Papilionoideae—Desmodieae—Desmodiinae)

Torre: 231 (1966); Verdcourt: 483 (1971b); Verdcourt: 534 (1974); Gonçalves: 102 (1981); Lock: 250 (1989); Verdcourt: 25 (2000).

Sthn trop. Afr. 2(3), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pseudeminia Verdc.

(Papilionoideae—Phaseoleae—Glycininae)

Verdcourt: 393 (1970b); Lock: 421 (1989); Mackinder: 45 (2001).

Trailing or climbing perennial herbs; stems covered in ferruginous or golden hairs. **Leaves** pinnately 3-foliolate; leaflets lobed; stipules and stipels present. **Inflorescences** many-flowered, dense axillary pseudoracemes; bracts conspicuous, secondary bracts present, bracteoles filiform. **Calyx** 5-lobed, pilose, lobes sharply narrowing to terminate in a filiform point, upper pair connate for up to half their length, not gland-tipped. **Corolla** medium-sized; standard elliptic, auriculate. **Stamens**: vexillary stamen free. **Ovary** spindle-shaped, hairy; style filiform, geniculate, hairy for most of its length, widening slightly at knee, then filiform and glabrous with a terminal stigma. **Pod** oblong, compressed, hairy, dehiscent, 1- or 2-seeded. **Seeds** black, essentially oblong to reniform; rim aril small, funicle remnant persistent.

Species ± 4, trop. Africa; sthn trop. Afr. 1: *Pseudeminia comosa* (Baker) Verdc. ("*Rhynchosia pseudocomosa*", unpublished name), Zambia, Zimbabwe, Malawi, Mozambique.

Pseudoeriosema Hauman

(Papilionoideae—Phaseoleae—Ophrestiinae)

Hauman: 96 (1955); Torre: 244 (1966); Lock: 422 (1989); Verdcourt: 28 (2001).

Herbs or weak subshrubs, erect or ± trailing; stems covered with long white hairs. **Leaves** 1-foliolate or pinnately 3-foliolate; stipules and usually stipels present. **Inflorescences** axillary or terminal, racemose or condensed and paniculate; bracts mostly persistent. **Calyx** 5-lobed, upper pair ± joined. **Corolla** small, scarcely exceeding calyx; standard obovate-oblong, lamina slightly produced on either side of claw but not truly auriculate, hairy. **Stamens**: vexillary filament free from others, somewhat enlarged and membranous; anthers uniform. **Ovary** 2-ovuled, velvety; style short, subulate, bent, thickened below, glabrous at apex; stigma capitate, glabrous. **Pod** oblong-ovoid, compressed, densely villous. **Seeds** oblong; hilum small and central; funicle dilated at apex.

Species ± 5, restricted to trop. Africa; sthn trop. Afr. 4, Angola, Zambia, Malawi.

Pseudoprosopis Harms

(Mimosoideae—Mimoseae)

Harms: 152 (1902); White: 93 (1962); Brenan & Brummitt: 31 (1970); Lock: 96 (1989); Bingham & Smith: 142 (2002).

Shrubs, lianes or small trees, unarmed; branchlets, petioles and rachides puberulous. **Leaves** 2-pinnate; petiole and rachis eglandular; pinnae opposite, in 2–5(7) pairs, each with 4–15 pairs of opposite leaflets. **Inflorescences** of dense, many-flowered racemes which are axillary and solitary or up to three together, and often aggregated on ± shortened shoots. **Flowers** bisexual. **Calyx** gamosepalous with 5 teeth. **Petals** 5, free or almost so, valvate in bud (or very slightly overlapping in their lower parts in *P. fischeri*). **Stamens** 10, fertile anthers each with a caducous apical gland. **Ovary** hairy. **Pods** straight or somewhat curved, compressed, woody, oblong, dehiscing from apex downwards into 2 recurving valves. **Seeds** lying ± obliquely in pod, each sunk in a depression in the valve, compressed, brown, glossy, unwinged, elliptic to ± rhombic, without endosperm.

Species 7, confined to trop. Africa; sthn trop. Afr. 2, Zambia, Mozambique.

Pseudovigna (Harms) Verdc.

(Papilionoideae—Phaseoleae—Glycininae)

Verdcourt: 390 (1970b); Lock: 423 (1989); Mackinder: 47 (2001).

Trailing or climbing perennial herbs; stems densely covered in ferruginous hispid hairs. **Leaves** pinnately 3-foliolate; leaflets lobed, with dense appressed silvery hairs on undersurface; stipules and stipels present. **Inflorescences** 2–8-flowered axillary pseudoracemes. **Calyx** 5-lobed, upper pair partly connate, covered in ferruginous hispid hairs. **Corolla** glabrous; petals clawed; standard obovate to broadly obovate, auriculate, without appendages. **Stamens**: vexillary stamen free or joined to others at base; anthers ± uniform. **Ovary** shortly stipitate to subsessile, oblong, hairy, 3-ovuled; style glabrous, slender, geniculate, flattened proximal to bend, terete distally; stigma terminal, fringed with hairs. **Pod** oblong, compressed, septate, dehiscent, covered in dark brown hairs, 1–3-seeded. **Seeds** black, oblong to reniform; aril poorly developed, funicle remnant persistent.

Monotypic genus: *Pseudovigna argentea* (Willd.) Verdc., trop. Africa; sthn trop. Afr.: Zimbabwe (cultivated), Mozambique.

Psophocarpus DC.

(Papilionoideae—Phaseoleae—Phaseolinae)

Candolle: 403 (1825); Torre: 278 (1966); Lock: 423 (1989); Mackinder: 63 (2001).

Herbs or subshrubs, prostrate or climbing, rarely erect. **Leaves** pinnately 3-foliolate; stipules appendaged below point of insertion; stipels present. **Inflorescence** an axillary pseudoraceme, subumbel or umbel; bracts and bracteoles present. **Calyx** 5-lobed, upper pair of lobes fused for all or part of their length; lower lobes various. **Corolla** mostly blue or mauve, rarely yellow; standard auriculate, appendaged. **Stamens** 10, 9 with filaments fused, 1 free to base or connate in middle. **Ovary** stipitate; ovules 3–many; style thickened above ovary, bent, flattened towards apex, bearded longitudinally or with a ring of hairs below stigma; stigma terminal or subterminal, penicillate or not. **Pod** narrowly cylindrical, 4-winged, septate, dehiscent. **Seeds** ovoid, oblong or square, brown to black or deep purple, with or without an aril.

Species 10, Old World; sthn trop. Afr. 3 indigenous, Angola, Zambia, Zimbabwe, Malawi, Mozambique.*P. tetragonolobus* (L.) DC. ("Winged Bean")

is widely cultivated, though unknown in the wild. It is thought to be Asian, Mascarene or Madagascan in origin. Winged Bean is cultivated mainly for its immature edible pods, but many parts of the plant including its tuberous roots are eaten. *P. tetragonolobus* is distinguished from the native species by its larger flowers (25–40 mm long) and pod up to 200 mm long. This account is based on Verdcourt and Halliday's revision of the genus in *Kew Bulletin* 33: 191–227 (1978).

Psoralea L.

(Papilionoideae—Psoraleeae)

Torre: 83 (1962); Lock: 457 (1989); Verdcourt: 48 (2000).

Sthn trop. Afr. 2, Mozambique, and sthn Afr.

Pterocarpus Jacq.

(Papilionoideae—Dalbergieae)

White: 162 (1962); De Sousa: 356 (1966); Lock: 241 (1989); Lock: 208 (1999); White *et al.*: 332 (2001); Coates Palgrave: 389 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pterolobium R.Br. ex Wight & Arn.

(Caesalpinioideae—Caesalpinieae)

White: 128 (1962); Brenan: 40 (1967); Lock: 26 (1989); White *et al.*: 309 (2001); Coates Palgrave: 343 (2002).

Cantuffa J.F.Gmel.; White: 119 (1962).

Sthn trop. Afr. 1: *Pterolobium stellatum* (Forssk.) Brenan, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ptycholobium Harms

(Papilionoideae—Millettiae)

Brummitt: 459 (1980); Lock: 366 (1989).

Sylitra E.Mey.; Torre: 141 (1962).

Sthn trop. Afr. 3 Angola, Zimbabwe, Mozambique, and sthn Afr.

Requienia DC.

(Papilionoideae—Millettieae)

Brummitt: 469 (1980); Lock: 366 (1989).

Tephrosia Pers. in part.

Sthn trop. Afr. 1: *Requienia sphaerosperma* DC., Zambia, and sthn Afr.

Rhynchosia Lour.

(Papilionoideae—Phaseoleae—Cajaninae)

Torre: 303 (1966); Lock: 424 (1989); Verdcourt: 70 (1971a); Verdcourt: 168 (2001); White *et al.*: 332 (2001); Coates Palgrave: 401 (2002).

Carrissoa angolensis Baker f.: 108 (1933); Torre: 322 (1966); Lock: 389 (1989) as *Carissoa*. *Dolicholus* Medik.; Hiern: 266 (1896).

Sthn trop. Afr. ± 60, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rhynchotropis Harms

(Papilionoideae—Indigofereae)

Harms: 86 (1901); Cronquist: 173 (1954a); Gillett: 6, 136 (1958); Torre: 140 (1962); Lock: 333 (1989).

Erect perennial herbs with medifixed hairs; rhizome branched, woody. **Leaves** alternate, unifoliolate, sessile or subsessile, linear or laneeolate, straight; stipules subulate to lanceolate-triangular, small. **Inflorescences** axillary, 7–15-flowered racemes. **Calyx** 5-lobed; lobes narrowly triangular, ± as long as, to longer than tube. **Corolla** with keel abruptly bent towards middle, rostrate. **Stamens** diadelphous: filaments of 9 fused, vexillar one free or fused to others at base; anthers with well-developed lacerate-fimbriate appendices at both ends, or apical one reduced to a few stiff hairs. **Ovary** linear, 3–6-ovulate; style twisted, cymbiform-dilated in lower half and abruptly contracted at base where it is eventually bent through a right angle; stigma oblique, discoid. **Pod** linear to sublinear, subsessile to shortly stipitate, dehiscent, finely strigose, spreading. **Seeds** separated by thin transverse partitions.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola, Zambia.

Robynsiophyton R.Wilczek

(Papilionoideae—Crotalarieae)

Wilczek: 126 (1953a); Wilczek: 286 (1953b); Torre: 6 (1962); White: 164 (1962); Lock: 232 (1989).

Annual or suffruteseent herbs, prostrate-ascending or erect. **Leaves** digitately 3-foliolate or sometimes simple in upper parts of branches; stipules 2, free; stipels absent. **Inflorescences** axillary or sometimes terminal subcapitate racemes; bracts linear-lanceolate. **Flowers** subsessile, bracteoles absent. **Calyx** 2-lipped, upper lip 2-lobed, lower lip 3-lobed; calyx ± as long as corolla, valvate in bud; tube cup-shaped; limb of 5 equal, narrowly lanceolate lobes longer than tube. **Corolla**: petals clawed; standard without callosities, longer than wings and keel; wings narrow; keel of petals similar to wings, cohering towards tip. **Stamens** monadelphous with 5 fertile stamens alternating with antherless staminodes; fertile stamens with filaments longer than those of staminodes and with globose to ellipsoid, subbasifixed anthers. **Ovary** sessile, tomentose; style erect, ± as long as ovary, glabrous; stigma terminal, capitate; ovules 6–10. **Pod** ± compressed, acute with ± persistent style, dehiscent. **Seeds** subreniform, with rudimentary arillus.

Monotypic: *Robynsiophyton vanderystii* Wilczek, central trop. Africa; sthn trop. Afr.: Angola, Zambia.

Rothia Pers.

(Papilionoideae—Crotalarieae)

Persoon: 638 (1807); Torre: 5 (1962); Milne-Redhead: 811 (1971); Lock: 232 (1989).

Sthn trop. Afr. 1: *Rothia hirsuta* (Guill. & Perr.) Baker, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Schefflerodendron Harms

(Papilionoideae—Milletticae)

Harms: 87 (1901); De Sousa: 167 (1962); Gillett: 153 (1971); Lock: 367 (1989).

Forest trees. **Leaves** imparipinnate; leaflets alternate; stipels small or shortly stalked, globular glands (flat when dry)

copious on inflorescence, calyx, corolla and ovary, where they are more or less hidden by a dark rusty brown crisped indumentum, and on the undersurface of the leaflets, where they are readily seen. **Calyx**: lobes short, broadly triangular. **Stamens**: vexillary stamen free, not bent or widened at base. **Ovary** stipitate. **Pod** inflated, woody, dehiscent, with very thick walls. **Seeds** 1 or 2.

Species 3 or 4, trop. Africa; sthn trop. Afr. 1: *Schefflerodendron adenopetalum* (Taub.) Harms, Angola.

Schotia Jacq.

(Caesalpinioideae—Detarieae)

Loek: 59 (1989); Léonard: 433 (1993); Coates Palgrave: 325 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. 2, Zimbabwe, Mozambique, and sthn Afr.

Scorodophloeus Harms

(Caesalpinioideae—Detarieae)

Harms: 77 (1901); Baker: 151 (1928); Léonard: 418 (1951); Torre & Hillcoat: 244 (1956); Brenan: 122 (1967); Liben: 48 (1970); Lock: 59 (1989).

Unarmed evergreen trees. **Leaves** once-pinnate; leaflets alternate, or some of them subopposite to opposite, 3–20, without gland dots. **Inflorescence** racemose. **Flowers** bisexual, spirally arranged along inflorescence axis; pedicels not jointed; bracteoles very small, not enclosing flower buds. **Sepals** 4, imbricate, glabrous inside or with a few short hairs near central part and at apex. **Petals** 5, subequal. **Stamens** 10; filaments free, glabrous; anthers dehiscing by longitudinal slits. **Ovary** stipitate, pubescent near margins; stipe of ovary adnate along one side to wall of subcylindric-turbinate hypanthium; ovules 2; style elongate; stigma very small, capitate. **Pods** flattened, woody, dehiscing elastically into 2 valves which are smooth or nearly so outside. **Seeds** large, compressed, with thin wrinkled (when dry, ?fleshy when fresh) wall, exareolate.

Species 2: 1 W trop. African coast, 1 E trop. African coast; sthn trop. Afr. 1: *Scorodophloeus zenkeri* Harms, Angola.

Senna Mill.

(Caesalpinioideae—Cassieae)

Lock: 338 (1988); Lock: 36 (1989); Luckow: 195 (1996); Coates Palgrave: 340 (2002).

Cassia L. in part; Mendonça & Torre: 174 (1956) in part.

Sthn trop. Afr. 16, mostly introduced, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sesbania Scop.

(Papilionoideae—Robinieae)

De Sousa: 180 (1962); White: 164 (1962); Lewis: 11 (1988); Lock: 460 (1989); Coates Palgrave: 380 (2002).

Sthn trop. Afr. 20, some introduced, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Smithia Aiton

(Papilionoideae—Aeschynomeneae—Aeschynomeninae)

White: 165 (1962); Gillett *et al.*: 408 (1971); Verdcourt: 445 (1974); Lock: 120 (1989); Verdcourt: 138 (2000).

Sthn trop. Afr. 1: *Smithia elliotii* Baker f., Zambia, Malawi, Mozambique, and sthn Afr.

Sophora L.

(Papilionoideae—Sophoreae)

Gillett *et al.*: 43 (1971); Lock: 475 (1989); Coates Palgrave: 353 (2002).

Sthn trop. Afr. 4: 3 indigenous in Zimbabwe and Mozambique, and 1 introduced in Zimbabwe; also in sthn Afr.

Sphenostylis E.Mey.

(Papilionoideae—Phaseoleae—Phaseolinae)

Torre: 275 (1966); Lock: 438 (1989); Verdcourt & Døygaard: 68 (2001).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stylosanthes Sw.

(Papilionoideae—Aeschynomeneae—Stylosanthinae)

Torre: 213 (1966); Verdcourt: 436 (1971b); Lock: 120 (1989); Verdcourt: 165 (2000).

Sthn trop. Afr.: at least 1 endemic: *Stylosanthes fruticosa* (Retz.) Alston; several others cultivated and reported as escapes, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Swartzia Schreb.

(Papilionoideae—Swartzieae)

Torre & Hillcoat: 167 (1956); Brenan: 218 (1967); Lock: 477 (1989); Coates Palgrave: 351 (2002); Dombo *et al.*: 10 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Tamarindus L.

(Caesalpinioideae—Amherstieae)

Torre & Hillcoat: 217 (1956); Brenan: 151 (1967); Lock: 19 (1989); Coates Palgrave: 330 (2002).

Sthn trop. Afr. 1: *Tamarindus indica* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tephrosia Pers.

(Papilionoideae—Millettieae)

Torre: 142 (1962); Gillett: 212 (1971); Brummitt: 459 (1980); Lock: 367 (1989); White *et al.*: 334 (2001); Bingham & Smith: 142 (2002); Coates Palgrave: 375 (2002).

Caulocarpus Baker; Torre: 141 (1962). *Lupinophyllum* Hutch.; Drummond: 223 (1972) as *Lupiniphyllum*.

Sthn trop. Afr. 80, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Teramnus P.Browne

(Papilionoideae—Phaseoleae—Glycininae)

Torre: 245 (1966); Lock: 439 (1989); Mackinder: 49 (2001).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tessmannia Harms

(Caesalpinioideae—Detarieae)

Harms: 295 (1910); Léonard: 384 (1949); Torre & Hillcoat: 220 (1956); White: 128 (1962); Brenan: 106 (1967); Lock: 60 (1989).

Unarmed evergreen trees. **Leaves** once-pinnate; leaflets alternate, rarely opposite, usually emarginate at apex, marked with numerous pellucid gland dots (visible at least before leaflets have thickened with maturity), without any marginal swelling near base. **Inflorescences** of terminal or axillary racemes or panicles. **Flowers** bisexual, distichously arranged along inflorescence axes; bracteoles small, not enclosing flower buds, soon falling off. **Sepals** 4, very narrowly imbricate, almost valvate, fulvous-tomentose inside. **Petals** 5, subequal or one somewhat narrower than rest, imbricate, clawed, with a crinkled lamina. **Stamens** 10; filaments tomentose below, one of them free, rest connate below into a short sulcate tube; anthers dorsifixed, dehiscing by longitudinal slits. **Ovary** stipitate, usually tomentose but sometimes only so on the stipe; ovules several to numerous; style elongate, coiled when young, with a capitate stigma. **Pods** flattened, woody, apparently indehiscent, short, warted or smooth outside. **Seeds** 1–4, black or brown, exareolate, with a small basal aril.

Species 11, trop. Africa; sthn trop. Afr. 4, Angola.

Tetraberlinia (Harms) Hauman

(Caesalpinioideae—Detarieae)

Hauman: 477 (1952a); Torre & Hillcoat: 208 (1956); Aubréville: 295 (1968b); Lock: 19 (1989); Wieringa: 255 (1999); Gervais & Bruneau: 30 (2002).

Julbernardia sect. *Tetraberlinia* (Harms) Troupin: 319 (1950).

Small to large trees; trunk straight, cylindric. **Leaves** 1(2)-jugate (outside region up to 34-jugate); leaflets opposite, not emarginate; stipules free with distal margins meeting at base in leaf axil. **Inflorescences** compound racemes, axillary or terminal; bracts pubescent in apical part; bracteoles fused with hypanthium. **Sepals** usually 5, slightly to considerably reduced; lateral sepals sometimes absent; adaxial sepals partly to completely fused. **Petals** 5; adaxial petal large, shortly clawed; lateral and abaxial petals reduced, usually inrolled or folded lengthwise. **Stamens** 10, adaxial stamen free, 9 united at base. **Ovary** stipitate, velvety to partly glabrous; ovules 2–5. **Pod** flat, woody, light brown, usually glabrous, obliquely oblong, with sutural margin thickened and with a ± median longitudinal ridge and a few shorter, variously orientated wrinkles. **Seeds** with very thin, membranous testa.

Species 7, tropical forest in W and C Africa; sthn trop. Afr. 1: *Tetraberlinia bifoliolata* (Harms) Hauman, Angola (Cabinda).

Tetrapleura Benth.

(Mimosoideae—Mimoseae)

Bentham: 345 (1841); Gilbert & Boutique: 218 (1952); Torre: 264 (1956); Brenan: 32 (1959); Lock: 97 (1989).

Unarmed trees. **Leaves** bipinnate, eglandular; pinnae 5–7(–10) pairs, opposite to alternate; leaflets 6–11(–13) on each side of pinna, oblong-elliptic to elliptic, with rounded to emarginated apex. **Inflorescences** axillary, solitary or rarely paired racemes. **Flowers** bisexual, yellowish to pinkish. **Calyx** gamosepalous, with 5 teeth. **Petals** 5, free, very narrowly obovate. **Stamens** 10, fertile, exserted; anthers with a caducous apical gland. **Pods** narrowly oblong, straight or slightly curved, woody, indehiscent; valves with a wing-like projection running longitudinally for whole length of valve, pod in section thus ± cruciform, internally septate between seeds. **Seeds** hard, dark brown, not winged.

Species 2, trop. Africa; sthn trop. Afr. 1: *Tetrapleura tetraptera* (Schumach. & Thonn.) Taub., Angola (Cabinda).

Trifolium L.

(Papilionoideae—Trifolieae)

Torre: 79 (1962); Lock: 489 (1989).

Sthn trop. Afr. 9, of which 5 are introduced, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Trigonella** L.

(Papilionoideae—Trifolieae)

Gillett: 387 (1965); Lock: 498 (1989).

Sthn trop. Afr. 2, both introduced, Zambia, Zimbabwe, and sthn Afr.

Tylosema (Schweinf.) Torre & Hillc.

(Caesalpinioideae—Cercideae)

Torre & Hillcoat: 198 (1956); Brenan: 213 (1967); Lock: 44 (1989); Germishuizen: 237 (2002).

Sthn trop. Afr. 1: *Tylosema fassoglense* (Schweinf.) Torre & Hillcoat, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Uraria Desv.

(Papilionoideae—Desmodieae—Desmodiinae)

Desvaux: 122 (1813); Torre: 233 (1966); Verdcourt: 479 (1971b); Verdcourt: 532 (1974); Lock: 251 (1989); Verdcourt: 34 (2000); Phiri (Unpublished).

Perennial herbs or subshrubs, prostrate or erect. **Leaves** pinnately 3–9-foliolate, less often partly or all 1-foliolate; leaflets often large and venose; stipules persistent, free, acuminate; stipels present. **Inflorescences** mostly terminal, spike-like racemes or panicles; primary bracts ovate or lanceolate, persistent or deciduous; secondary bracts and bracteoles absent. **Calyx** 5-lobed; 3 lower lobes equal, and longer than upper pair (often appearing to be lower pair due to twisting of pedicel). **Corolla** yellowish or purplish; standard rounded or obovate, narrowed into a claw; wings oblong-falcate, adhering to keel, which is slightly incurved and obtuse. **Stamens**: vexillary stamen free; anthers uniform. **Ovary** sessile or shortly stipitate, 2–many-ovuled; style filiform, recurved at apex; stigma terminal, capitate. **Pods** folded like a concertina, mostly enclosed in persistent calyx, subsessile, constricted between seeds, segments ovate, inflated, 1-seeded and indehiscent. **Seeds** subglobose or compressed, oblong-ellipsoid; hilum lateral, aril not developed.

Species 20, Old World tropics; sthn trop. Afr. 2, Angola, Zambia, Malawi, Mozambique.

Vicia L.

(Papilionoideae—Vicieae)

Torre: 237 (1966); Lock: 504 (1989).

Sthn trop. Afr. 3, of which 1 is introduced, Angola, Zambia, Zimbabwe,

Malawi, and sthn Afr.

Vigna Savi

(Papilionoideae—Phaseoleae—Phaseolinae)

Torre: 261 (1966); Lock: 440 (1989); Pasquet: 121 (2001); Bingham & Smith: 142 (2002).

Voandzeia Thouars; White: 166 (1962); Torre: 278 (1966); Gonçalves: 121 (1981). *Haydonia* Wilczek; White: 152 (1962); Phiri (Unpublished).

Sthn trop. Afr. 42, of which 3 are introduced, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Xanthocercis Baill.

(Papilionoideae—Sophoreae)

Gonçalves: 121 (1981); Lock: 476 (1989); Coates Palgrave: 352 (2002).

Pseudocadia Harms; White: 161 (1962).

Sthn trop. Afr. 1: *Xanthocercis zambesiaca* (Baker) Dumaz-le-Grand, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Xeroderris Roberty

(Papilionoideae—Millettieae)

Gillett *et al.*: 91 (1971); Gonçalves: 122 (1981); Lock: 386 (1989); Coates Palgrave: 395 (2002).

Ostryoderris Dunn in part; Burtt Davy *et al.*: 78 (1958); White: 161 (1962).

Sthn trop. Afr. 1: *Xeroderris stuhlmannii* (Taub.) Mendonça & E.P.Sousa, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Xylia Benth.

(Mimosoideae—Mimoseae)

Brenan & Brummitt: 33 (1970); Lock: 98 (1989); Coates Palgrave: 307 (2002); Izidine & Bandeira: 51 (2002); Bingham (Unpublished).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Zornia J.F.Gmel.

(Papilionoideae—Aeschynomeneae—Poiretiinae)

Torre: 215 (1966); Milne-Redhead: 442 (1971); Gonçalves: 123 (1981); Lock: 121 (1989); Verdcourt: 159 (2000).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Flacourtiaceae
(in broad sense, including Achariaceae, Aphloiaceae, Salicaceae (in broad sense) and Samydaceae)
(Dilleniidae—Violales)
(Eurosids I—Malpighiales; divided into Achariaceae, Aphloiaceae and Salicaceae)

Chase *et al.* (2002) found the Flacourtiaceae to be composed of two clades that are more closely related to other families in the Malpighiales than to each other. In the clade containing the type genus *Flacourtia* the Salicaceae are embedded. The other clade includes the members of the Achariaceae, a conserved family name. Therefore they propose to recognize two families: (1) Salicaceae (in broad sense), and (2) Achariaceae (in broad sense). They further propose to place *Aphloia* in the monotypic family Aphloiaceae, which they consider to fall outside the Malpighiales. The families and tribes to which they assign the genera of Flacourtiaceae from sthn trop. Afr. are shown in brackets for all genera in the text below, and families are also given in the following key below. Achariaceae, Aphloiaceae and Salicaceae are treated more fully in their position in the alphabetic arrangement of this work. Herewith a few observations on the more obvious differences between these families:

Achariaceae: All members of this family have petals and they are ofter larger and more numerous than the sepals; petals often have an adnate adaxial scale; sepals are often only 3; stamens are mostly many, rarely 5 or 8–10, anthers are mostly 2 mm or longer (except in *Kiggelaria*) and often linear; a disc or glands on the receptacle are usually absent; flowers are uni- or bisexual;

fruits are baccate or capsular, sometimes slightly woody.

Aphloiaceae: a family with only one genus and one highly variable species, *Aphloia theiformis* (Vahl) Benn., occurring in eastern trop. Africa, Madagascar and the Mascareignes. It differs from all other members of Flacourtiaceae (in broad sense) by a single parietal placenta, and from some members in its bisexual flowers without petals, many stamens with anthers shorter than 1 mm; without a disc or glands on the receptacle; a very short style with a peltate stigma with a median furrow; and a fleshy berry with ± 6 seeds.

Salicaceae: Petals are absent or present, and then usually as many and ± as large as the sepals; sepals and petals are often similar; filaments vary from 5–many with small anthers shorter than 1 mm and not much longer than broad (except in *Oncoba* where they are ± 2 mm long and linear); a disc or disc glands are usually present; flowers uni- or bisexual; fruits are capsular or baccate and seeds are often arillate.

Sthn trop. Afr.: genera 23, species 53 (also given separately under Achariaceae, Aphloiaceae and Salicaceae).

Bredenkamp, C.L. in Leistner: 304 (2000).

Key to Achariaceae, Aphloiaceae and Salicaceae
[as defined by Chase *et al.* (2002)]

1a Perianth absent ..... **Salix** (Salicaceae)
1b Perianth present, either as sepals or of both sepals and petals:
2a Petals absent; anthers mostly shorter than 1 mm and not much longer than broad:
3a Leaves with linear or circular pellucid glands; stamens connate at the base with the alternating disc glands ..... **Casearia** (Salicaceae)
3b Leaves generally without pellucid glands (very fine glands are very rarely present in *Dovyalis*); stamens free:
4a Stamens in bundles of ± 10 alternating with the sepals; fruit a capsule ..... **Bivinia** (Salicaceae)
4b Stamens irregularly arranged; fruit a berry or a berry-like drupe:
5a Ovary 1-locular; flowers bisexual; spines usually absent:
6a Disc glands present; style 2–4-fid in its upper part; berry reddish yellow ..... **Ludia** (Salicaceae)
6b Disc glands absent; style very short; stigma subsessile, almost discoid; berry white ..... **Aphloia** (Aphloiaceae)
5b Ovary falsely 3–8-locular; flowers unisexual, rarely bisexual; spines generally present:
7a Stamens surrounded by a ring of disc glands; ovary with 2 ovules per locule, one above the other; fruit a berry-like drupe with 1-seeded pyrenes in pairs ..... **Flacourtia** (Salicaceae)
7b Stamens intermingled with disc glands and alternating with them; ovules 1–6 per placenta; fruit a berry with 1 or 2 seeds ..... **Dovyalis** (Salicaceae)
2b Petals present, sometimes similar to sepals; anthers of varying size:
8a Petals ± as many as sepals; anthers of genera placed in Salicaceae mostly shorter than 1 mm, not much longer than broad, if ± 2 mm long and linear, then flowers up to 90 mm in diameter with a conspicuous central golden mass of stamens (*Oncoba*); anthers of genera placed in Achariaceae mostly longer than 2 mm; sepals mostly more than 3:
9a Inflorescence epiphyllous (on petiole or on midrib of leaf lamina):
10a Sepals, petals and stamens all 5; style entire; flowers always bisexual ..... **Mocquerysia** (Salicaceae)
10b Sepals and petals 3 or 4(5); stamens 20–40; flowers unisexual or bisexual (plants polygamous) ..... **Phyllobotryon** (Salicaceae)
9b Inflorescence axillary, terminal or cauline:
11a Petals without a basal internal gland or scale:
12a Stamens many, not collected in bundles opposite petals; fruit a berry ..... **Scolopia** (Salicaceae)
12b Stamens equal in number to petals or in bundles opposite petals; fruit usually a capsule:
13a Leaves with 5–9 nerves from base; flowers unisexual; seeds with a red aril ..... **Trimeria** (Salicaceae)
13b Leaves penninerved; flowers bisexual; seeds without an aril:
14a Style simple with a capitate or minutely bilobed stigma; flowers in pedunculate cymes; stipules deltoid ..... **Gerrardina** (Salicaceae)
14b Styles 2–6 or 2–6-cleft; flowers in racemes or panicles; stipules absent or large and orbicular or reniform ..... **Homalium** (Salicaceae)
11b Petals with a basal fleshy or hairy gland on the inner face:
15a Petals whorled (cyclically arranged); stamens 8–12 ..... **Kiggelaria** (Achariaceae)
15b Petals spirally arranged; stamens either 5 or 16 or more:
16a Stamens 5 ..... **Scottellia** (Achariaceae)
16b Stamens 16 or more:
17a Sepals free, ± half as large as petals; racemes subspicate, rather short ..... **Rawsonia** (Achariaceae)
17b Sepals connate in lower third, ± as large as petals; racemes slender, elongate ..... **Dasylepis** (Achariaceae)
8b Petals more than sepals; anthers mostly longer than 2 mm; sepals mostly 3:
18a Fruit with 4–6 crenate membranous wings:
19a Petals 5–7; style short, with (2)3(4) ± horizontally diverging stigmas as long as or longer than style ..... **Grandidiera** (Achariaceae)
19b Petals 10–12; style simple, entire ..... **Poggea** (Achariaceae)
18b Fruit a capsule, often woody, or indehiscent, smooth or with spines or soft bristles:

20a Sepals valvate; fruit echinate with branching soft bristles or spines ..... **Buchnerodendron** (Achariaceae)
20b Sepals imbricate; fruit smooth, or with simple bristles or spines:
21a Branches spiny; fruit indehiscent ..... **Oncoba** (Salicaceae)
21b Branches unarmed; fruit dehiscent by 3–8 valves:
22a Style filiform, entire, rarely shortly divided; fruit 1–3-seeded ..... **Lindackeria** (Achariaceae)
22b Style with 5–8 stigmatic lobes or branches; fruit many-seeded:
23a Fruit with a thick woody pericarp; petiole not swollen distally ..... **Xylotheca** (Achariaceae)
23b Fruit a capsule with a leathery or fibrous pericarp; petiole swollen distally ..... **Caloncoba** (Achariaceae)

Aphloia (DC.) Benn.

(Aphloiaceae)

Wild: 279 (1960); White: 265 (1962); Wild & Vidigal: 19 (1973); Sleumer: 55 (1975); Killick: 80 (1976); White *et al.*: 266 (2001); Coates Palgrave: 760 (2002); Phiri (Unpublished).

Sthn trop. Afr. 1: *Aphloia theiformis* (Vahl) Benn., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bivinia Jaub. ex Tul.

(Salicaceae—Homalieae)

Jaubert & Tulasne: 78 (1857); Wild: 294 (1960); Wild & Vidigal: 37 (1973); Sleumer: 51 (1975); Coates Palgrave: 758 (2002); Mapaura & Timberlake: 165 (2002).

Tall trees; bark light grey; branches thin; branchlets greyish brown with pale lenticels, with a thin grey pubescence when young. **Leaves** alternate, petiolate, ovate, broadly elliptic or somewhat obovate, long-acuminate at apex, crenate-dentate; stipules absent. **Flowers** bisexual, in axillary or rarely terminal, dense, cylindric racemes; pedicels articulated near middle; bracts small and linear; receptacle very shallow. **Sepals** 5 or 6, valvate, with broad, truncate, pubescent glands adnate to base of each sepal. **Petals** 0. **Stamens** in fascicles of ± 10 alternating with sepals; filaments folded in bud; anthers globose, very small. **Ovary** 1-locular with 4–6 multi-ovulate placentas; styles 4–6, filiform. **Fruit** a small dry capsule with 4–6 valves. **Seeds** few, with long hairs; endosperm fleshy; cotyledons thin and flat.

Monotypic genus: *Bivinia jalbertii* Tul., Madagascar and E trop. Africa; sthn trop. Afr.: Zimbabwe, Mozambique.

Buchnerodendron Gürke

(Achariaceae—Lindackerieae)

Gürke: 151 (1893); Exell & Mendonça: 84 (1937/1951); Wild: 267 (1960); Wild & Midigal: 7 (1973); Sleumer: 289 (1974c); Sleumer: 13 (1975); Hul: 39 (1995).

Unarmed small bushes; sometimes dioecious; branches stiffly erect, golden-tomentose at first, later glabrescent. **Leaves** ovate-oblong, broadly ovate or obovate, base cordate, margins serrate, petiolate with ± caducous stipules. **Flowers** in axillary, cymose panicles, racemes or fascicles, bisexual or unisexual. **Sepals** 3, subvalvate, free to base. **Petals** 6–12, imbricate, larger than sepals. **Stamens** very many, in two series, outer stamens somewhat longer than inner ones; filaments slender, rather short; anthers linear, dehiscing by slits. **Ovary** 1-locular, with 3–5 parietal multi-ovulate placentas; style simple, apex subentire. **Fruit** a globose, tardily dehiscent, echinate capsule splitting into 3–5 longitudinal valves (? or indehiscent). **Seeds** moderately numerous, ovoid or compressed, with a crustaceous testa, arillate at base, sometimes pubescent; embryo straight, cotyledons foliaceous, ovate.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda), Mozambique.

Caloncoba Gilg

(Achariaceae—Lindackerieae)

Gilg: 458 (1908); Exell: 20 (1926); White: 265 (1962); Wild & Vidigal: 10 (1973); Sleumer: 120 (1974a); Sleumer: 21 (1975); Hul: 40 (1995) (sinks the genus under *Oncoba*); White *et al.*: 266 (2001).

Small shrubs or small to medium trees with unarmed branches. **Leaves** on long petioles or almost sessile; lamina glabrous, scaly or hairy, sometimes glandular-punctate; stipules caducous. **Flowers** often large, in axillary fascicles or solitary, bisexual and male, often appearing before leaves. **Sepals** 3, imbricate, concave. **Petals** 8–12, larger than sepals. **Stamens** many, with linear or sagittate-linear anthers dehiscing by slits or pores. **Ovary** 1-locular with 5–8 multi-ovulate placentas; style simple with 5–8 distinct stigmas, or stigmatic apex only slightly lobed and somewhat peltate. **Fruit** an echinate or smooth, dehiscent, ovoid, globose or ellipsoid capsule splitting into 5–8 valves, many-seeded and sometimes with a fleshy or gelatinous pulp.

Species ± 8, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Malawi, Mozambique.

Casearia Jacq.

(Salicaceae—Samydeae)

Wild: 293 (1960); Fernandes: 204 (1970); Sleumer: 397 (1971); Wild & Vidigal: 35 (1973); Sleumer: 47 (1975); Killick: 91 (1976); White *et al.*: 266 (2001); Coates Palgrave: 766 (2002).

Sthn trop. Afr. 4, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dasylepis Oliv.

(Achariaceae—Erythrospermeae)

Oliver: 170 (1865); Burtt Davy & Hoyle: 54 (1958); Wild: 263 (1960); Sleumer: 6 (1975).

Trees with glabrous vegetative parts; branches slender, dark brown, striate. **Leaves** entire or serrulate, often somewhat undulate, petiolate with caducous stipules. **Flowers** bisexual or male by abortion, in lax racemes or crowded and ± spicate. **Sepals** 4 or 5, almost free, outer ones scarcely smaller, usually orbicular. **Petals** 4–7, imbricate like inner sepals but larger, with thick hairy scales adnate at base within. **Stamens** indefinite, free; anthers linear to narrowly lanceolate, dehiscing longitudinally. **Ovary** free, glabrous or hairy, 1-locular with 2–4 multi-ovulate placentas; style short or long, simple or divided in upper half into 2–4 branches; stigmas 2–4, short. **Fruit** a globose capsule with hard leathery pericarp; style persistent, splitting into 2–4 longitudinal sections. **Seeds** few.

Species 6, trop. Africa; sthn trop. Afr. 1: *Dasylepis burtt-davyi* Edlin, endemic, so far as is known, to Mt Mlanje, Malawi.

Dovyalis E.Mey. ex Arn.

(Salieaceae—Flacourtieae)

Sleumer: 85, 361 (1937/1951); Wild: 281 (1960); Sleumer: 64 (1972a); Wild & Vidigal: 22 (1973); Sleumer: 59 (1975); Langenegger: 84 (1976); White *et al.*: 268 (2001); Coates Palgrave: 761 (2002); Msekandiana & Mlangeni: 36 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Flacourtia L'Hér.

(Salicaceae—Flacourtieae)

Hiern: 40 (1896); Sleumer: 85, 361 (1937/1951); Wild: 285 (1960); White: 265 (1962); Wild & Vidigal: 27 (1973); Killick: 82 (1976); White *et al.*: 272 (2001); Coates Palgrave: 760 (2002).

Sthn trop. Afr. 1: *Flacourtia indica* (Burm.f.) Merr. (=*F. flavescens* Willd.), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gerrardina Oliv.

(Salicaceae—Homalieae)

Wild: 287 (1960); Wild & Vidigal: 30 (1973); Sleumer: 37 (1975); Killick: 72 (1976); White *et al.*: 272 (2001); Mapaura (Unpublished).

Sthn trop. Afr. 1: *Gerrardina eylesiana* Milne-Redh., Zimbabwe, Malawi, Mozambique.

Grandidiera Jaub.

(Achariaceae—Lindackerieae)

Jaubert: 467 (1866); Wild & Vidigal: 8 (1973); Sleumer: 11 (1975).

Shrubs or trees. **Leaves** alternate, persistent, petiolate, oblanceolate to obovate, entire or undulate, penninerved; stipules subulate, pubescent. **Flowers** unisexual or bisexual; bisexual flowers with slightly larger sepals and petals and with fewer (35–50) stamens than male flowers. **Inflorescences** short, axillary, few-flowered, spike-like, shortly hairy racemes from upper axils; terminal flower bisexual, lower flowers male; subtending bracts several, membranous, small. **Sepals** 3, imbricate, small. **Petals** 5–7, imbricate, small. **Stamens** many; filaments filiform; anthers dorsifixed near base, longitudinally dehiscent. **Ovary** 1-locular, with 2–4 multi-ovulate parietal placentas, sessile, shortly 4–6(–8)-winged; style short; stigmas (2)3(4), horizontally divergent. **Fruit** globular, woody, tardily dehiscent, with 4–6(–8) short, membranous, crenate wings. **Seeds** many, ovoid, small.

Monotypic genus: *Grandidiera boivinii* Jaub., eastern trop. Africa; sthn trop. Afr.: Mozambique.

Homalium Jacq.

(Salicaceae—Homalieae)

Wild: 287 (1960); Fernandes: 205 (1970); Sleumer: 239 (1973); Wild & Vidigal: 31 (1973); Sleumer: 42 (1975); Hul: 62 (1995); White *et al.*: 273 (2001); Bingham & Smith: 144 (2002) under Samydaceae; Coates Palgrave: 756 (2002); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Kiggelaria L.

(Achariaceae—Pangieae)

Wild: 265 (1960); Wild & Midigal: 5 (1973); Sleumer: 31 (1975); White *et al.*: 273 (2001); Coates Palgrave: 751 (2002); Phiri (Unpublished).

Sthn trop. Afr. 1: *Kiggelaria africana* L., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lindackeria C.Presl

(Achariaceae—Lindackerieae)

Presl: 89, t. 65 (1835); Sleumer: 83, 361 (1937/1951); Wild: 267 (1960); White: 266 (1962); Sleumer: 311 (1974f); Sleumer: 24 (1975); Hul: 40 (1995) sinks the genus under *Oncoba*; White *et al.*: 274 (2001).

Unarmed shrubs or trees. **Leaves** simple; lamina usually rather large, glabrous or hairy, hairs stellate or simple, margins usually toothed; petioles sometimes elongate; stipules present. **Flowers** bisexual or male by abortion, in racemes or solitary in axils. **Sepals** 3, imbricate, concave. **Petals** 6–12, imbricate, not much longer than sepals. **Stamens** many; filaments slender, free or rarely connate in a tube; anthers linear. **Ovary** shortly stalked, smooth, tuberculate or shortly echinate, usually hairy, 1-locular with 3 parietal placentas; placentas multi-ovulate or with relatively few ovules; style simple with inconspicuous stigmas. **Fruit** a globose, woody, echinate or warted capsule dehiscing tardily into 3 longitudinal valves. **Seeds** 1–3, with copious endosperm and a large embryo with flat, cordate cotyledons.

Species 13, trop. Africa; sthn trop. Afr. 4, Angola, Zambia, Malawi.

Ludia Comm. ex Juss.

(Salicaceae—Flacourtieae)

Burtt Davy *et al.*: 55 (1958); Wild & Vidigal: 21 (1973); Sleumer: 53 (1975); Dowsett-Lemaire & White: 78 (1990); White *et al.*: 274 (2001); Coates Palgrave: 759 (2002).

Unarmed small trees or shrubs. **Leaves** alternate, petiolate, persistent, entire, oblong, oblanceolate, obovate or elliptic, apex usually shortly attenuate, base cuneate, nerves in 6–8 pairs, steeply ascending; stipules 0. **Flowers** bisexual, small, solitary or rarely 2 or 3 together from same axil, subsessile, subtended by several minute suborbicular bracts. **Sepals** 5 or 6, in one whorl, imbricate, densely pubescent outside and in upper part of inside, reflexed at anthesis. **Petals** 0. **Stamens** 40–60, arising on a flat receptacle with several small glands, among many hairs; filaments filiform; anthers small, connective generally rather obscure. **Ovary** glabrous, 1-locular, with 2–4 parietal placentas bearing few to many ovules; style columnar, 2–4-lobed or -partite at apex. **Fruit** baccate, with persistent style, 1-locular, hardly or tardily and irregularly dehiscent; pericarp coriaceous. **Seeds** few; testa hard.

Species ± 23, mainly Madagascar and Mascarenes, 1 in tropical eastern Africa: *Ludia mauritiana* J.F.Gmel.; sthn trop. Afr.: Malawi, Mozambique.

Mocquerysia Hua

(Salicaceae—Scolopieae)

Hua: 259 (1893); Exell: 20 (1926); Sleumer: 86 (1937/1951); Hul: 164 (1991); Hul: 27 (1995).

Unarmed, single-stemmed shrubs. **Leaves** alternate, simple, petiolate, narrowly obovate, cuneate at base, long-acuminate at apex, dentate to denticulate, glabrous; stipules linear-acuminate, glabrous. **Inflorescences** epiphyllous, usually in 1-flowered cymes in 2–6 groups per leaf on petiole or on midrib in lower $^3/_4$ of lamina. **Flowers** bisexual; pedicel pubescent, ± as long as flower; bracts narrowly ovate. **Sepals** 5, imbricate, very narrowly ovate to linear-ovate, pubescent, persistent. **Petals** 5, imbricate, narrowly ovate to linear-ovate, pubescent, persistent. **Stamens** 5; filaments very short, glabrous; anthers lanceolate, glabrous or glabrescent. **Ovary** 1-locular, with 3 multi-ovulate parietal placentas, tomentose; style simple, truncate, persistent in fruit. **Fruit** an ovoid capsule, pubescent to glabrescent, surrounded by perianth.

Monotypic genus: *Mocquerysia multiflora* Hua, trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Oncoba Forssk.

(Salicaceae—tribal affinities not yet known)

Exell: 20 (1926); Sleumer: 81, 361 (1937/1951); Burtt Davy *et al.*: 55 (1958); Wild: 275 (1960); Wild & Vidigal: 15 (1973); Hul: 40 (1995); White *et al.*: 274 (2001); Coates Palgrave: 749 (2002).

Caloncoba Gilg in part; Sleumer: 120 (1974a); Wild & Vidigal: 10 (1973). *Camptostylus* Gilg; Sleumer: 283 (1974b).

Sthn trop. Afr. 1: *Oncoba spinosa* Forssk., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Phyllobotryon Müll.Arg.

(Salicaceae—Scolopieae)

Müller Argoviensis: 534 (1864); Hul: 155 (1991); Hul: 23 (1995).

Phylloclinium Baill.; Exell & Mendonça: 361 (1937/1951); Sleumer: 29 (1975).

Erect, glabrous shrubs, not or little branched. **Leaves** alternate, clustered near tips of branchlets, petiolate, persistent, elongate-obovate or -spathulate, apex rounded but tip abruptly long-acuminate, long-attenuate towards base, subcoriaceous, ± sharply serrate-dentate; lateral nerves in 14–18 pairs, prominent on both faces; stipules lanceolate, caducous. **Inflorescence** epiphyllous, 1–3(4)-flowered, on midrib of upper $^2/_3$–$^3/_4$ of lamina, glabrous; median bract ovate-lanceolate, accrescent. **Flowers** bisexual or unisexual (plants polygamous), pedicelled. **Sepals** 3 or 4(5), imbricate, rather irregular and dry, ovate, ciliolate. **Petals** 4–6, imbricate, thin, much larger than sepals, ciliate. **Stamens** 25–40, free; filaments subulate; anthers almost basifixed, longitudinally dehiscent, apiculate by protruding connective. **Ovary** superior, glabrous, 1-locular, with 2–4 multi-ovulate parietal placentas; style simple, shortly 2–4-fid. **Capsule** opening with 2 or 3 valves; pericarp woody. **Seeds** weakly arillate; with endosperm.

Species 5, trop. Africa; sthn trop. Afr. 1: *Phyllobotryon paradoxum* (Baill.) Hul, Angola.

Poggea Gürke

(Achariaceae—Lindackerieae)

Gürke: 162 (1893); Sleumer: 80, 360 (1937/1951); Bamps: 11 (1968); Sleumer: 296 (1974d); Hul: 35 (1995).

Unarmed shrubs. **Leaves** alternate, petiolate, obovate, attenuate towards base, acuminate at apex, denticulate, papyraceous; stipules lanceolate, pubescent, persistent. **Flowers** bisexual, solitary in axils of upper leaves; peduncle pubescent. **Sepals** 3, imbricate, oblong to suborbicular, tomentose outside, glabrous inside. **Petals** 10–12, obovate, puberulous inside. **Stamens** many; filaments filiform, glabrous; anthers longitudinally dehiscent. **Ovary** superior, 1-locular, with 2–5 multi-ovulate parietal placentas; style simple, entire, persistent in fruit, glabrescent. **Capsules** ovoid, with 4–6 broad coriaceous wings, tardily dehiscent. **Seeds** many, ovoid, angular, finely pubescent.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola.

Rawsonia Harv. & Sond.

(Achariaceae—Erythrospermeae)

Sleumer: 79 (1937/1951); Wild: 262 (1960); Wild & Midigal: 3 (1973); White *et al.*: 276 (2001); Coates Palgrave: 748 (2002); Msekandiana & Mlangeni: 41 (2002); Lebrun & Stork: 420 (2003).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Scolopia Schreb.

(Salicaceae—Scolopieae)

Sleumer: 84 (1937/1951); Wild: 276 (1960); Wild & Vidigal: 17 (1973); Dowsett-Lemaire & White: 78 (1990); White *et al.*: 278 (2001); Coates Palgrave: 752 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Scottellia Oliv.

(Achariaceae—Erythrospermeae)

Oliver: t. 2265 (1893); Sleumer: 79 (1937/1951); Bamps: 9 (1968); Sleumer: 275 (1972b); Hul: 32 (1995).

Dasypetalum Pierre ex A.Chev.

Trees up to 30 m high; trunk straight, slightly fluted; branchlets glabrous. **Leaves** alternate, persistent, simple, entire to crenulate, petiolate, cuneate at base, acuminate at apex, coriaceous, glabrous, with 5–8 pairs of secondary nerves; petiole thickened at both ends; stipules 0. **Inflorescences**: racemes grouped in pseudopanicles, axillary; rachis slender to subfiliform; bracts minute, caducous. **Flowers** bisexual. **Sepals** 5, elliptic-ovate, ciliate. **Petals** 5, similar in size to sepals but usually thinner, oblong-ovate to elliptic-obovate, each with a basal scale-like hairy appendage. **Stamens** 5, alternating with petals; filaments linear-subulate, ± twice as long as anthers; anthers acutely triangular in outline, deeply bifid up to basal attachment of filament, longitudinally dehiscent. **Ovary** substipitate, glabrous, 1-locular with 3 pluri-ovulate parietal placentas; style short, shortly trifid at apex. **Fruit** a subglobose capsule splitting into 3 eventually ± reflexed valves; pericarp coriaceous to almost woody, pustular or verruculose outside, smooth or wrinkled inside. **Seeds** 1 or 2(3), subglobose-angular, smooth, covered by a thin bright red or orange-red arillus.

Species 3, tropical (mainly W) Africa; sthn trop. Afr. 1: *Scottellia klaineana* Pierre (=*S. gossweileri* Exell), Angola.

Trimeria Harv.

(Salicaceae—Homalieae)

Wild: 296 (1960); Wild & Vidigal: 38 (1973); Sleumer: 302 (1974e); Sleumer: 39 (1975); Coates Palgrave: 758 (2002).

Sthn trop. Afr. 1: *Trimeria grandifolia* (Hochst.) Warb., Zimbabwe, Mozambique, and sthn Afr.

Xylotheca Hochst.

(Achariaceae—Lindackerieae)

Sleumer: 81 (1937); Wild: 272 (1960); Wild & Vidigal: 11 (1973); Sleumer: 18 (1975); Coates Palgrave: 750 (2002).

Sthn trop. Afr. 2, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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*Fumariaceae
(Magnoliidae—Papaverales)
(Eudicots—Ranunculales)

Jordaan, M. in Leistner: 308 (2000).

Sthn trop. Afr.: genus 1, species 1.

*Fumaria L.

Exell & Mendonça: 49, 381 (1937/1951); Exell: 181 (1960); Lidén: 42 (1986); Lidén: 316 (1993).

Sthn trop. Afr. 1:*_Fumaria muralis_ Sond. ex W.D.J.Koch, Zimbabwe, and sthn Afr.

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Gelsemiaceae
(Loganiaceae in part)
(Asteridae—Gentianales)
(Euasterids I—Gentianales)

Shrubs, undershrubs, or sometimes lianas, with simple hairs or nearly glabrous; stems much branched; twigs usually thin. **Leaves** opposite, those of a pair equal or subequal, shortly petiolate; lamina mostly papyraceous when dry, ovate to very narrowly elliptic, on lateral branches often smaller, entire or obscurely sinuate-dentate, pinnately veined; veins conspicuous; stipules membranaceous, usually triangular, entire, those of a pair united, or all fused into a short ochra. **Inflorescence** axillary or terminal, usually on short lateral branches mostly obliquely and incompletely dichasial, 1–many-flowered; bracts mostly small and sepal-like. **Flowers** dimorphic. **Sepals** 5, green, connate at base up to half their length, equal or unequal, ovate to very narrowly elliptic, obtuse to subulate at apex, entire or sometimes obscurely sinuate-dentate. **Corolla** infundibuliform; lobes 5, imbricate in bud, spreading, orbicular or nearly so, white, sometimes pale yellow, orange or red, much longer than calyx; tube ± 3–5 times as long as lobes. **Stamens** 5, arising on corolla tube, alternating with corolla lobes, equal or unequal, included or, in long-staminate flowers, exserted; filaments pubescent or sometimes glabrous, arising $^1/_4$ to $^1/_3$ from base of corolla tube; anthers orbicular or oblong, thecae 2, discrete, divergent at base, opening by longitudinal slit. **Ovary** superior, 2-locular; ovules 2 per locule, arising at base of septum; style simple; stigma twice dichotomously branched, lobes narrow, pubescent. **Fruit** capsular, loculicidal, 4-valved, valves hinging on septum, locules with 1 or 2 seeds. **Seeds** obliquely ovate to orbicular, pale brown, dull and densely adpressed-pilose.

Genera 2, species 10, N to tropical America, Africa and E Asia; sthn trop. Afr. genus 1, species 2.

Leeuwenberg: 1 (1961) under Loganiaceae; Mabberley: 468 (1997); Takhtajan: 424 (1997); Angiosperm Phylogeny Group: 429 (2003).

Mostuea Didr.

Didrichsen: 86 (1854); Good: 100 (1929); Bruce: 159 (1956); Burtt Davy *et al.*: 60 (1958) as *Mostuaea*; Leeuwenberg: 1 (1961); White: 339 (1962); Leeuwenberg: 344 (1983); White *et al.*: 338 (2001) (in all preceding references under Loganiaceae); Mapaura (Unpublished), under Spigeliaceae.

Description as for family.

Species 8, 7 in trop. Africa, 1 in S America; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

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Gentianaceae
(Asteridae—Gentianales)
(Euasterids I—Gentianales)

Bredenkamp, C.L. & Victor, J.E. in Leistner: 310 (2000).

Sthn trop. Afr.: genera 12, species 77.

Key to genera
[after Sileshi Nemomissa (2002)]

1a Trees or shrubs ..... **Anthocleista**
1b Herbs or suffrutices:
2a Calyx winged at the keel; capsule 2-locular with axile placentation:
3a Flowers usually blue, rarely white or pink; corolla tube shorter than 1 mm; anthers without apical and basal glands ..... **Exacum**
3b Flowers usually yellow, rarely cream or white; corolla tube ± 3mm long; anthers usually with 1 apical and 2 basal glands ..... **Sebaea**
2b Calyx not winged; capsule 1-locular with parietal placentation:
4a Flowers 3-merous ..... **Pycnosphaera**
4b Flowers (3)4, 5(–7)-merous:
5a Anthers twisting spirally on dehiscing ..... **Chironia**
5b Anthers not twisting spirally:
6a Corolla lobes with 1 or 2 fringed nectaries at the base, these 0.5–3 mm across ..... **Swertia**
6b Corolla lobes without nectaries:
7a Flowers usually 5-merous; filaments with 2 hood-like scales at the base ..... **Enicostema**
7b Flowers usually 4-merous; filaments without scales at the base:
8a Fertile stamens usually 1 or 2, sterile stamens conspicuously shorter than fertile ones:
9a Inflorescences terminal head-like cymes; flowers usually regular; upper leaves redueed and scale-like ..... **Schinziella**
9b Inflorescenees lax eymes; flowers slightly irregular; leaves not reduced and scale-like ..... **Canscora**
8b All stamens fertile:
10a Corolla tube with fimbriate-papillose scales or scabrid-denticulate; stamens arising in the sinuses of the corolla lobes ..... **Faroa**
10b Corolla tube smooth; stamens arising on the corolla tube:
11a Calyx leathery; lobes 3-nerved ..... **Neurotheca**
11b Calyx papyraceous; lobes 1-nerved ..... **Congolanthus**

Anthocleista Afzel. ex R.Br.

Exell: 101 (1929); Leeuwenberg: 328 (1983) under Loganiaceae; Leeuwenberg: t. 2080 (1993) under Loganiceae; White *et al.*: 336 (2001) under Loganiaceae; Coates Palgrave: 932 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Canscora Lam.

Lamarck: 601 (1785); Paiva & Nogueira: 36 (1990); Bingham & Smith: 142 (2002); Sileshi Nemomissa: 40 (2002).

Annual herbs. **Stems** erect, much branched, 4-ridged or narrowly 4-winged, glabrous. **Leaves** sessile, sometimes connate and decurrent on a ridge or narrowly winged; lamina lanceolate, elliptic, ovate to ovate-lanceolate, 3–5-nerved. **Flowers** 4-merous, in terminal or axillary, lax cymes, sometimes solitary. **Calyx** tube terete or winged; lobes much shorter than tube. **Corolla** regular or rarely irregular; tube cylindric, with 4 equal or unequal (2 large and 2 short) lobes, much shorter than tube. **Stamens** 4, inserted at different levels in corolla tube, often some sterile; filaments short; anthers ovoid or ellipsoid not twisted. **Ovary** ellipsoid or cylindric, unilocular; ovules many; style filiform; stigma bilobed. **Capsule** cylindric, bivalved. **Seeds** many; testa minutely reticulate-pitted.

Species 12, tropics of Indonesia, Malaysia, Australia and Africa; sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique.

Chironia L.

Baker & Brown: 554 (1903); Boutique: 33 (1972); Paiva & Nogueira: 32 (1990); Sileshi Nemomissa: 43 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Congolanthus A.Raynal

Raynal: 56 (1968); Boutique: 17 (1972); Paiva & Nogueira: 6 (1990); Sileshi Nemomissa: 30 (2002).

Annual herbs. **Stems** erect, slender, often branched, 4-angled. **Leaves** ovate to elliptic or obovate, linear at apex of branches, entire. **Flowers** 4-merous, axillary, solitary or 2- or 3-nate. **Calyx** tube cylindric, with 4 ribs and 8 delicate veins, papyraceous; lobes 1-nerved. **Corolla** tube cylindric, with 4-lobes. **Filaments** included in corolla tube or exserted; anthers narrowly ellipsoid, not twisted. **Ovary** narrowly ellipsoid, unilocular; ovules many; style oblong-cylindric; stigma bilobed. **Capsule** narrowly cylindric, bivalved.

Monotypic genus: *Congolanthus lougidens* (N.E.Br.) A.Raynal, trop. Africa; sthn trop. Afr.: Zambia. The genus has affinities with *Neurotheca*.

Enicostema Blume

Paiva & Nogueira: 49 (1990); Sileshi Nemomissa: 24 (2002).

Hippion in sense of Hiern: 711 (1898).

Sthn trop. Afr. 1: *Enicostema axillare* (Lam.) Raynal, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Exacum L.

Boutique: 52 (1972); Klackenberg: 5 (1985); Paiva & Nogueira: 8 (1990); Sileshi Nemomissa: 2 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Faroa Welw.

Welwitsch: 45 (1869); Taylor: 69 (1973a); Taylor: 190 (1973b); Paiva & Nogueira: 41 (1990); Bingham & Smith: 142 (2002).

Annual or perennial herbs, sometimes somewhat succulent. **Stems** erect to prostrate, simple or ± branched, terete to 4-angled, usually ± narrowly winged. **Leaves** linear to ovate, often connate, sometimes dilated and scarious at base. **Flowers** 4-merous, usually pedicellate, in axillary, few- to many-flowered fascicles. **Calyx** a campanulate tube with 4 erect lobes. **Corolla** tube equaling or shorter than calyx, with 4 ± semilunate, fimbriate-papillose scales subtending filaments; lobes 4, spreading, ovate-lanceolate, as long as or shorter than tube. **Stamens** arising in sinuses of corolla lobes; filaments filiform; anthers ovoid. **Ovary** ± obovoid, unilocular; ovules many; style filiform; stigma simple, subcapitate, or bilobed, or obsolete, or divided in 2 filiform lobes. **Capsule** obovoid, bivalved. **Seeds** many, subglobose, minutely scrobiculate.

Species ± 17, throughout trop. Africa; sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique. Records of *Faroa salutaris* Welw. from sthn Afr. by Paiva & Nogueira (1990) and Sileshi Nemomissa (2002) have not been confirmed by Bredenkamp & Victor (2000 and pers. com.).

Neurotheca Salisb. ex Benth.

Raynal: 45 (1968); Boutique: 14 (1972); Paiva & Nogueira: 4 (1990); Sileshi Nemomissa: 27 (2002).

Sthn trop. Afr. 2, Angola, Mozambique, and sthn Afr.

Pycnosphaera Gilg

Gilg: 333 (1903); Boutique: 3 (1972); Paiva & Nogueira: 47 (1990) as *Pychnosphaera*; Sileshi Nemomissa: 36 (2002).

Monotypic genus: *Pycnosphaera buchananii* (Baker) N.E.Br., trop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, and sthn Afr. Sileshi Nemomissa (2002) states that five species of this genus occur in trop. Africa.

Schinziella Gilg

Gilg: 74 (1895); Boutique: 28 (1972); Paiva & Nogueira: 39 (1990); Sileshi Nemomissa: 38 (2002).

Erect perennial herbs. **Stems** not or sparsely branched from base. **Leaves** sessile, upper ones much reduced and scale-like. **Flowers** 4-merous, in compact, pedunculate, terminal heads. **Calyx** tube as long as lobes. **Corolla** regular with a cylindric tube and with 4 lobes ± as long as tube, without nectaries. **Stamens** 4, unequal, 3 sterile, 1 larger, fertile. **Ovary** cylindric-ovoid, unilocular; ovules many; style filiform; stigma bilobed. **Capsule** narrowly obovoid, bivalved. **Seeds** many, subglobose.

Monotypic genus: *Schinziella tetragona* (Schinz) Gilg, trop. Africa; sthn trop. Afr.: Angola, Zambia, Malawi, Mozambique.

Sebaea Sol. ex R.Br.

Hiern: 705 (1898); Boutique: 38 (1972); Paiva & Nogueira: 10 (1990); Sileshi Nemomissa: 217 (2000); Bingham & Smith: 142 (2002); Sileshi Nemomissa: 4 (2002).

Sthn trop. Afr. 26, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Swertia L.

Hiern: 711 (1898); Gilg: 335 (1903) as *Sweertia*; Boutique: 4 (1972); Paiva & Nogueira: 26 (1990); Sileshi Nemomissa: 145 (1997); Sileshi Nemomissa: 419 (1998); Sileshi Nemomissa: 46 (2002).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Geraniaceae
(Dilleniidae—Malvales)
(Rosids—Geraniales)

Dreyer, L.L. & Makwarela, A.M. in Leistner: 312 (2000).

Sthn trop. Afr.: genera 4, species 21.

Geranium L.

Laundon: 131 (1963); Müller *et al.*: 2 (1969); Exell: 145 (1970); Strugnell: 17 (2002).

Sthn trop. Afr. 7, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Monsonia L.

Exell & Mendonça: 258 (1951); Müller & Bowden: 136 (1963); Exell: 145 (1970); Müller *et al.*: 6 (1969); Venter: 5 (1979); Albers: 241 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Pelargonium L'Hér.

Exell & Mendonça: 259 (1951); Müller: 140 (1963); Müller *et al.*: 8 (1969); Van der Walt & Vorster: 517 (1983).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sarcocaulon (DC.) Sweet

Exell & Mendonça: 259 (1951); Schreiber & Merxmüller: 391 (1976); Moffett: 581 (1979); Moffett & Ward-Hilhorst: 22 (1995); Dreyer *et al.*: 240 (1997).

Monsonia L. in part; Albers: 241 (2002).

Sthn trop. Afr. 1: *Sarcocaulon mossamedense* (Welw. ex Oliv.) Hiern, Angola, and sthn Afr.

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Gesneriaceae
(Asteridae—Scrophulariales)
(Euasterids I—Lamiales)

Smithies, S.J. in Leistner: 314 (2000).

Sthn trop. Afr.: genus 1, species 24.

Streptocarpus Lindl.

Hiern: 789 (1900); Hilliard & Burtt: 130 (1971); Hilliard & Burtt: 43 (1988); Hilliard & Burtt: 321 (1990); La Croix: 82 (1994); Weigend & Edwards: 59 (1996); Burtt: 378 (1999); Izidine & Bandeira: 50 (2002).

Sthn trop. Afr. 24, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Gisekiaceae
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Dreyer, L.L. & Jordaan, M. in Leistner: 314 (2000).

Sthn trop. Afr.: genus 1, species 2.

Gisekia L.

Gonçalves: 304 (1970) under Aizoaceae; Gonçalves: 522 (1978) under Molluginaceae; Gonçalves: 2 (1979) under Molluginaceae; Gilbert: 343 (1994); Lebrun & Stork: 259 (2003) under Aizoaceae.

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Goodeniaceae
(Asteridae—Campanulales)
(Euasterids II—Asterales)

Welman, W.G. in Leistner: 315 (2000).

Sthn trop. Afr.: genus 1, species 1.

Scaevola L.

Launert: 85 (1983); Welman & Condy: 104 (2001).

Sthn trop. Afr. 1: *Scaevola plumieri* (L.) Vahl, sea shores in Angola, Mozambique, and sthn Afr.

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Gunneraceae
(sometimes placed under Haloragaceae)
(Rosidae—Haloragidales)
(Core Eudicots—Gunnerales)

Bredenkamp, C.L. in Leistner: 317 (2000).

Sthn trop. Afr.: genus 1, species 1.

Gunnera L.

Boutique & Verdcourt: 1 (1973); Mendes: 79 (1978) under Haloragaceae; Wanntorp *et al.*: 85 (2001).

Sthn trop. Afr. 1: *Gunnera perpensa* L., Zimbabwe, Mozambique, and sthn Afr.

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Haloragaceae
(Rosidae—Haloragidales)
(Core Eudicots—Saxifragales)

Bredenkamp, C.L. in Leistner: 317 (2000).

Sthn trop. Afr.: genera 2, species 3.

Laurembergia P.J.Bergius
Exell: 231 (1933); Mendes: 31 (1970); Mendes: 74 (1978).

Serpicula L.; Hiern: 332 (1896).

Sthn trop. Afr 1: *Laurembergia tetrandra* (Schott) Kanitz subsp. *brachypoda* (Welw. ex Hiern) A.Raynal, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Myriophyllum L.
Mendes: 77 (1978).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

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Hamamelidaceae
(Hamamelidae—Hamamelidales)
(Core Eudicots—Saxifragales)

Jordaan, M. in Leistner: 318 (2000).

Sthn trop. Afr.: genus 1, species 2.

Trichocladus Pers.
White: 67 (1962); Teixeira: 29 (1970); Mendes & Vidigal: 71 (1978); Mendes & Vidigal: 2 (1983); Dowsett-Lemaire & White: 79 (1990); Endress: 322 (1993); White *et al.*: 287 (2001); Coates Palgrave: 243 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Hernandiaceae
(Magnoliidae—Magnoliales)
(Magnoliids—Laurales)

Jordaan, M. in Leistner: 318 (2000).

Sthn trop. Afr.: genera 2, species 3.

Additional family characters distinguishing *Illigera* from *Gyrocarpus*: Lianes; leaves digitately 5-foliolate; fruit with 2 broad lateral wings.

Gyrocarpus Jacq.
White: 58 (1962); Verdcourt: 6 (1985); Stannard: 60 (1997); Coates Palgrave: 219 (2002).

Sthn trop. Afr. 1: *Gyrocarpus americanus* Jacq. subsp. *africanus* Kubitzki, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Illigera Blume
Blume: 1153 (1827); Exell: 174 (1928); Keay: 59 (1954); Kubitzki: 157 (1969); Verdcourt: 4 (1985); Kubitzki: 337 (1993).

Lianas climbing by means of twisting petioles. **Leaves** 5-foliolate; leaflets ovate to ovate-lanceolate. **Inflorescences** cincinnate, terminal and axillary. **Flowers** bisexual, 5-merous; buds ellipsoid. **Tepals** 5 + 5, valvate. **Stamens** 5, opposite outer tepals, alternating with minute glands; filaments with 2 appendages at base. **Ovary**: tube accrescent to form 2 broad lateral wings. **Seeds**: cotyledons planoconvex to unequal, one surrounding the other.

Species ± 20, Old World tropics; sthn trop. Afr. 2, Angola.

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Heteropyxidaceae
(Rosidae—Myrtales)
(Rosids—Myrtales)

Victor, J.E. in Leistner: 319 (2000).

Sthn trop. Afr.: genus 1, species 2.

Heteropyxis Harv.

Martins: 51 (1976); Fernandes: 212 (1978); Fernandes: 2 (1980); Tobe & Raven: 197 (1987); White *et al.*: 289 (2001); Coates Palgrave: 840 (2002).

Sthn trop. Afr. 2, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Humiriaceae
(Rosidae—Linales)
(Eurosids I—Malpighiales)

Large trees; terminal branches glabrous, often with aromatic juice. **Leaves** alternate, simple, petiolate, slightly toothed or crenate, glabrous; stipules minute, extra-axillary, caducous. **Inflorescence** cymose-paniculate, dichotomous, axillary or terminal; peduncle robust, branches and pedicels minutely pubescent; bracts amplectant, persistent. **Flowers** bisexual, regular. **Sepals** 5, ± united at base, imbricate, broadly orbicular, puberulous, especially in basal portion, ciliate. **Petals** 5, free, imbricate, linear, clawed, pubescent. **Disc** intrastaminal, membranous, laciniate, appressed to ovary. **Stamens** 10, 5 opposite sepals longer than 5 opposite petals; filaments united at base, thick, flattened; anthers dorsally attached near base, versatile; thecae 2, disjunct, ellipsoid, each containing only 1 pollen sac, attached to lower portion of a thick, fleshy, ovate-acuminate connective; dehiscing by detachment. **Ovary** superior, 5-locular, glabrous; ovule 1 per locule, pendulous, anatropous, bitegmic, on apical-axile placenta; style simple, 5-grooved, stout; stigma capitate, 5-lobed. **Fruit** a ± subglobose drupe; exocarp fibrose-carnose, hard when dry; endocarp woody, slightly 10-sulcate and bullate, with resinous cavities. **Seeds** usually only 1 or 2; embryo ± straight; endosperm fleshy and oily.

Genera 8, species 50, tropical S America north to Costa Rica, and in W Africa; sthn trop. Afr.: genus 1, species 1.

Jussieu: 87 (1829); Winkler: 126 (1931); Exell & Mendonça: 392 (1951); Keay: 354 (1958); Cuatrecasas: 44 (1961); Badré: 47 (1972).

Sacoglottis Mart.

Martius: 146 (1827); Exell: 50 (1927) as *Saccoglottis*; Winkler: 128 (1931); Exell & Mendonça: 249 (1951); Cuatrecasas: 161 (1961); Liben: 80 (1971); Badré: 47 (1972).

Description as for family.

Species 9, tropical America and W Africa; sthn trop. Afr. 1: *Sacoglottis gabonensis* (Baill.) Urb., Angola. The only African species, also found in Liberia, Côte d'Ivoire, Nigeria, Cameroun, Gabon and the DRC.

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Hydnoraceae
(Magnoliidae—Aristolochiales)
(Magnoliids—Piperales)

Jordaan, M. in Leistner: 319 (2000).

Sthn trop. Afr.: genus 1, species 1.

Hydnora Thunb.

Musselman: 16 (1997); Beentje & Luke: 1 (2002).

Sthn trop. Afr. 1: *Hydnora abyssinica* A.Braun in Schweinf., Angola, Zimbabwe, and sthn Afr.

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Hydrophyllaceae
(Asteridae—Solanales)
(Euasterids I; included in Boraginaceae)

Retief, E. in Leistner: 320 (2000).

Sthn trop. Afr.: genus 1, species 2.

Hydrolea L.

Linnaeus: 328 (1762); Exell: 106 (1929); Verdcourt: 2 (1989); Verdcourt: 57 (1990).

Annual or perennial herbs, decumbent below and sometimes rooting at nodes. **Leaves** alternate, entire; stipules absent. **Flowers** bisexual, regular, in pedunculate, terminal, few- to many-flowered cymes. **Calyx** deeply divided into 5 lobes, imbricate at base. **Corolla** 5-lobed, rotate-campanulate, deep blue, white at base. **Stamens** 5, arising at sinuses of corolla; filaments filiform, usually dilated at base; anthers sagittate, apiculate. **Ovary** 2(3)-locular, with fleshy placentas adnate to septa; ovules many per locule; styles 2, subulate, distinct from base; stigmas capitate. **Fruit** a ± ellipsoid, usually septicidally bivalved capsule. **Seeds** many, minute.

Species ± 20, tropics and subtropics of Old and New World, 7 in Africa; sthn trop. Afr. 2, Angola, Zambia.

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Hydrostachyaceae
(Asteridae—Callitrichales)
(Asterids—Cornales)

Glen, R.P. in Leistner: 321 (2000).

Sthn trop. Afr.: genus 1, species 3.

Hydrostachys Thouars

Hess: 375 (1953); Cusset: 76 (1973); Stannard: 11 (1997).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Note: *Goetze 433*, the holotype of *Hydrostachys angustisecta* Engl., was collected in Tanzania, not in Mozambique as given by Cusset: 102 (1973).

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Icacinaceae
(Rosidae—Icacinales)
(Euasterids I)

Archer, R.H. in Leistner: 321 (2000).

Sthn trop. Afr.: genera 12, species 26.

Key to genera
[adapted from Villiers (1973)]

1a Leaves opposite:
2a Shrubs or trees, often spinescent; flowers bisexual ..... **Cassinopsis**
2b Lianes with tendrils, not armed; flowers unisexual ..... **Iodes**
1b Leaves alternate:
3a Shrubs or trees:
4a Inflorescence umbelliform or of corymbiform panicles:
5a Inflorescences leaf-opposed, consisting of several umbellate heads; disc present; calyx small, shortly 5-toothed; anthers densely villous ..... **Lasianthera**
5b Inflorescences axillary, of corymbiform or umbelliform panicles; disc absent; calyx with sepals ± free; anthers glabrous ..... **Alsodeiopsis**
4b Inflorescence a spike, raceme, cyme, or glomerate:
6a Flowers unisexual; inflorescences cauline: loose spikes or racemes arranged in fascicles on cushions at nodes of older branches ..... **Stachyanthus**
6b Flowers bisexual; inflorescences axillary, extra-axillary or terminal:
7a Petals united into a cylindric tube; sepals ± free; stamens with filaments adnate to the petals ..... **Leptaulus**
7b Petals free or joined at the base; calyx 5-toothed; stamens with filaments free to slightly cohering at the base:
8a Flowers in terminal panicles; anthers linear, up to half as long as filaments; fruit with a fleshy red (drying black) lateral appendage ..... **Apodytes**
8b Flowers in axillary or supra-axillary fascicles, spikes or racemes, or flowers solitary; anthers ellipsoid to ovoid, much shorter than filaments; fruit without a fleshy lateral appendage:
9a Flowers in simple, many-flowered supra-axillary fascicles; filaments broadened below; petals not bearded on inner face .. **Rhaphiostylis**
9b Flowers in axillary spikes or racemes or solitary; filaments filiform throughout; petals bearded on inner face ..... **Icacina**
3b Lianes or climbing shrubs:
10a Inflorescences cauline: loose spikes or racemes arranged in fascicles on cushions at nodes of older branches ..... **Stachyanthus**
10b Inflorescences ± axillary:
11a Flowers in simple, ± axillary fascicles on pedicels ± as long as the flowers or longer; filaments markedly broadening below ..... **Rhaphiostylis**
11b Flowers in spikes or racemes; filaments not markedly broadening below:
12a Drupe completely enveloped by the strongly accrescent corolla terminating in a long slender cone or tube; the secondary nerves on leaves often prolonged beyond the margin as hydathodes:
13a Leaves penninerved, elliptic, ± entire; flowers 4-merous; female flowers with staminodes; male flowers in dense spikes ..... **Chlamydocarya**
13b Leaves palmati- to penninerved, often lobed; flowers 3-merous; female flowers without staminodes; male flowers in small dense heads arranged in panicles ..... **Polycephalium**
12b Drupe not surrounded by the accrescent corolla; leaves without hydathodes:
14a Calyx absent; flowers usually unisexual; stigma sessile, consisting of several radiating tubes; endocarp spiny on inner surface ..... **Pyrenacantha**
14b Calyx and petals present; flowers bisexual; style terete, often excentric; stigma capitate; endocarp not spiny on inner surface ..... **Icacina**

Alsodeiopsis Oliv.

Oliver: 996 (1867); Exell: 224 (1932); Sleumer: 359 (1942); Exell & Mendonça: 341 (1951b); Keay: 637 (1958); Lucas: 8 (1968); Villiers: 18 (1973).

Shrubs or sometimes small trees, with usually stiff hairs on young branches and leaves. **Leaves** alternate, entire, penninerved. **Flowers** bisexual, regular, small, on slender pedicels, axillary in cymes or racemes. **Sepals** 5, free or partially united at base. **Petals** 5, free or united up to half their length, valvate. **Stamens** 5, free, alternating with petals; filaments short; anthers ovate-oblong or sagittate, apiculate. **Ovary** 1-locular, hirsute; style filiform; stigma small, capitate; ovules 2, pendulous. **Fruit** an oblong-ellipsoid drupe. **Seed** large, woody.

Species 11, trop. Africa; sthn trop. Afr. 1: *Alsodeiopsis weissenborniana* J.Braun & K.Schum., Angola.

Apodytes E.Mey. ex Arn.

Exell & Mendonça: 343 (1951b); White: 221 (1962); Mendes: 343 (1963); Lucas: 4 (1968); White *et al.*: 291 (2001); Coates Palgrave: 636 (2002).

Sthn trop. Afr. 1: *Apodytes dimidiata* E.Mey. ex Arn., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cassinopsis Sond.

Mendes: 341 (1963); Potgieter & Van Wyk: 117 (1994); Coates Palgrave: 635 (2002).

Sthn trop. Afr. 2, Zimbabwe, Mozambique, and sthn Afr.

Chlamydocarya Baill.

Baillon: 276 (1872); Exell & Mendonça: 346 (1951b); Boutique: 247 (1960); Villiers: 88 (1973).

Tall dioecious lianes with irritating hairs, especially those on fruit. **Leaves** alternate, entire or subdenticulate, penninerved with secondary nerves often prolonged beyond leaf margin by projecting hydathodes. **Inflorescences**: spikes of glomerules. **Male flowers** in cauline or axillary spikes; calyx absent; petals 4; stamens 4, with distinct filaments; anthers ellipsoid; gynoecium rudimentary. **Female flowers** in glomerules or spikes; sepals 4, ± fused at base; petals 4, fused into a tube ending in a crown of hairs and strongly accrescent in fruit; staminodes 4, alternisepalous; ovary 1-locular; style short, tubular; stigma divided. **Fruit** globose drupes, lower part fused with corolla; upper part surrounded by the strongly accrescent corolla narrowing into a long tube; endocarp crustaceous to subwoody with prickles on inner surface. **Seeds** with numerous small pits corresponding to prickles on inside of endocarp; embryo as long as seed.

Species 6, trop. Africa; sthn trop. Afr. 1(2), Angola.

Icacina A.Juss.

Jussieu: 174 (1823); Oliver: 356 (1868); Exell & Mendonça: 342 (1951); Keay: 639 (1958); Villiers: 50 (1973).

Shrubs, trees or lianes, often with thick underground tubers. **Leaves** alternate, entire, penninerved. **Inflorescences** axillary, extra-axillary or terminal panicles, spikes of fascicles. **Flowers** bisexual. **Calyx** small, ± deeply 5-toothed. **Petals** 5, free, valvate, pubescent on inner face. **Stamens** 5; filaments free; anthers ovoid-oblong. **Disc** hypogynous, ± well-developed. **Ovary** 1-locular, often asymmetric, ovoid-oblong, narrowing towards apex; ovules 2; style often excentric, and bifid; stigma capitate, small. **Fruit** a 1-seeded, ellipsoid, often asymmetric drupe; endocarp crustaceous. **Seed** with small embryo situated at summit of endosperm.

Species 6, trop. Africa; sthn trop. Afr. 3, Angola.

Iodes Blume

Blume: 29 (1825); Exell & Mendonça: 347 (1951b); Boutique: 239 (1960); Lucas: 15 (1968); Villiers: 5 (1973).

Dioecious lianes with tendrils ± as long as leaves, arising at leaf nodes. **Leaves** opposite, entire, penninerved. **Inflorescences**: flowers borne in axillary cymose panicles, rarely terminal umbels. **Flowers** unisexual, pedicellate, articulated below calyx. **Calyx** deeply 4- or 5-toothed, sometimes absent. **Petals** 3–5, ± united at base. **Male flowers** with 3–5 stamens alternating with petals; filaments very short, ± flattened. **Female flowers**: ovary subsessile, 1-locular, stigma sessile, discoid, sometimes slightly excentric; ovules 2, pendulous. **Fruit** a drupe, ellipsoid; endocarp woody. **Seeds** large.

Species 28, Old World tropics; sthn trop. Afr. 2, Angola.

Lasianthera P.Beauv.

Palisot de Beauvois: 85 (1806); Oliver: 353 (1868); Exell & Mendonça: 342 (1951b); Boutique: 263 (1960); Villiers: 14 (1973).

Glabrous shrubs or small trees. **Leaves** alternate, entire, penninerved. **Inflorescences** umbels of small heads opposite leaves. **Flowers** bisexual. **Calyx** small, shortly 5-toothed. **Petals** 5, valvate, cohering in a tube but easily separated to base. **Stamens** alternating with petals, free or adnate at base to petals, with a tuft of long hairs on inside near base of anthers; anthers with a tuft of hairs on back. **Disc** unilateral, pressed against one side of ovary. **Ovary** 1-locular, ± oval in outline but beaked and dorsiventrally flattened and thus narrowly oval in cross section; style short, glabrous; stigma small. **Fruit** a dorsiventrally flattened drupe with remains of disc attached to base. **Seed**: embryo small, apical on endosperm.

Monotypic genus: *Lasianthera africana* P.Beauv., tropical W Africa; sthn trop. Afr.: Angola.

Leptaulus Benth.

Bentham: 351 (1862); Exell & Mendonça: 341 (1951b); Boutique: 260 (1960); Mendes: 343 (1963); Lucas: 1 (1968); Villiers: 57 (1973).

Evergreen shrubs or small trees; bark pale grey-brown. **Leaves** alternate, elliptic to narrowly elliptic, entire, rather coriaceous, petiolate. **Flowers** bisexual, in subumbellate cymes or solitary, white, drying chrome-yellow. **Calyx** deeply 5-lobed; lobes slightly imbricate. **Petals** 5, united nearly to apex, valvate with inflexed tips. **Stamens** 5, alternating with petals and adnate to them for most of their length. **Ovary** with a somewhat excentric style as long as corolla tube; stigma funnel-shaped. **Fruit** an oblong-ellipsoid drupe. **Seed** oblong-ellipsoid.

Species 6, trop. Africa and Madagascar; sthn trop. Afr. 2, Angola (Cabinda), Zambia.

Polycephalium Engl.

Engler: 227 (1897); Exell &Mendonça: 346 (1951b); Boutique: 246 (1960); Villiers: 96 (1973).

Dioecious lianes; branches ferruginous-tomentose. **Leaves** alternate, 3- to 5-lobed or entire, palmati- or penninerved, nerves prolonged beyond lamina by projecting hydathodes; densely tomentose underneath. **Male flowers** very small, in dense, many-flowered glomerules arranged in panicles; calyx absent; corolla campanulate, petals 3, united; stamens 3, with filiform filaments, anthers oblong; ovary absent or rudimentary. **Female flowers** in dense, solitary, axillary globose heads; calyx campanulate, truncate or shortly 3-lobed; corolla campanulate, shorter than calyx, fused at base with ovary; ovary ellipsoid, style pubescent, ending in a peltate, multifid stigma. **Fruit** a drupe, globose to ellipsoid, tomentose, completely surrounded by accrescent corolla terminating in a cone; endocarp woody, verrucose on inner surface. **Seed** with small embryo situated at apex of oily endosperm.

Species 2, trop. Africa; sthn trop. Afr. 1: *Polycephalium lobatum* (Pierre) Pierre ex Engl. (=*P. poggei* Engl.), Angola.

Pyrenacantha Wight

Exell & Mendonça: 344 (1951b); Mendes: 347 (1963); Lucas: 10 (1968); Villiers: 69 (1973); Eggli: 287 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rhaphiostylis Planch. ex Benth.

Bentham: 259 (1849); Exell & Mendonça: 343 (1951b); Mendes: 345 (1963); Lucas: 6 (1968); Villiers: 31 (1973).

Glabrous, evergreen, straggling shrubs or woody lianes; bark smooth, dark grey; young branches dark purple. **Leaves** alternate, narrowly lanceolate to elliptic, entire, glossy dark green, petiolate. **Flowers** bisexual, in 4- to many-flowered supra-axillary fascicles; pedicels glabrous, ± equalling flowers. **Calyx** small, 5-fid. **Petals** 5, valvate, free, white. **Stamens** 5; filaments compressed below, filiform above, altemipetalous. **Ovary** 1-locular with a filiform, persistent excentric style. **Fruit** an obliquely dorso-ventrally compressed, reticulately wrinkled drupe with a persistent style.

Species 6, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique.

Stachyanthus Engler

Engler: 227 (1897) name conserved; Exell: 224 (1932); Boutique: 257 (1960); Villiers: 66 (1973).

Neostachyanthus Exell & Mendonça: 111 (1951a); Exell & Mendonça: 344 (1951b).

Dioecious climbing shrubs; branches hirsute. **Leaves** alternate, entire, shortly petiolate, penninerved. **Inflorescences**: male and female in loose spikes or racemes arranged in fascicles on cushions at nodes of older branches; bracts small. **Male flowers**: 5- or 6-merous; calyx cup-shaped, shortly toothed; petals valvate, coiled outwards before anthesis; stamens with filiform filaments ± as long as linear anthers; disc present or absent. **Female flowers** similar to male ones but disc always absent; ovary 1-locular, oblong-ovate, stigma sessile, discoid. **Fruit** an ellipsoid, ± flattened drupe; endocarp crustaceous, verrucose to smooth inside. **Seed** often pitted; endosperm markedly mottled.

Species 5, trop. Africa; sthn trop. Afr. 2, Angola.

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Irvingiaceae

(Rosidae—Sapindales)
(Eurosids I—Malpighiales)

Trees, usually tall, glabrous; stems with mucilage cavities. **Leaves** alternate, simple, entire, pinnately veined, coriaceous, petiolate, not gland-dotted; stipules intrapetiolar, large, very long, folded around terminal bud, early caducous and leaving a very distinct scar around stem. **Inflorescence** a panicle, terminal, axillary or on twigs below leaves. **Flowers** usually bisexual, regular, small, in terminal or axillary racemes or panicles. **Sepals** (4)5, free to slightly united at base, imbricate. **Petals** (4)5, free, equal, longer than sepals, imbricate. **Disc** intrastaminal, thick, fleshy, cushion-shaped. **Stamens** (8)10 (twice as many as petals), arising at base of disc, free or fused at base; anthers 2-thecous, circular-ovate, introrse with longitudinal slit; pollen spherical, tricolporate. **Ovary** superior but partly to deeply immersed in disc, 2- or 5-locular, locules 1-ovulate; ovules pendulous from apical-axile placenta; style simple; stigma truncate or capitate. **Fruit** drupaceous, with 1(2) or (4)5 nutlets, and fleshy, edible mesocarp. **Seeds** compressed; testa shiny; endosperm sparse to absent; cotyledons plano-convex.

Genera 3, species ± 8, tropical Old World; sthn trop. Afr. genera 2, species 6. Engler: 396 (1931) places *Irvingia* and *Klainedoxa* under Irvingioideae of Simaroubaceae. Robson & Gonçalves: 1 (1969) and Verdcourt: 1 (1984) consider Irvingiaceae to be a subfamily of Ixonanthaceae.

Exell & Mendonça: 279, 395 (1951); Gilbert: 109 (1958); Keay: 692 (1958); Aubréville: 12 (1962); Exell: 220 (1963); Harris: 143 (1996); Mabberley: 365

(1997); Takhtajan: 310, 312 (1997); Harris: 1 (1999).

Key to genera

Stipules covering terminal buds usually longer than 50 mm; ovary globular, (4)5-locular; drupe depressed-subglobular, containing (4)5 nuts .... **Klainedoxa**
Stipules covering terminal buds usually shorter than 50 mm; ovary slightly flattened, 2-locular; drupe ± ellipsoid, containing 1 nut ..... **Irvingia**

Irvingia Hook.f.

Hooker: 167 (1860); Engler: 398 (1931); Gilbert: 112 (1958); Keay: 693 (1958); Aubréville: 21 (1962); Harris: 166 (1996); Harris: 8 (1999); Dombo *et al.*: 10 (2002).

Trees, sometimes very tall. **Leaves** papyraceous to coriaceous; stipules mostly shorter than 40 mm. **Flowers** bisexual or sometimes unisexual by abortion. **Sepals** small, free or slightly united at base. **Petals** spreading, much longer than sepals. **Stamens** with free filaments. **Ovary** 2-locular, slightly sunk into disc, ± globular. **Fruit** a ± ellipsoid drupe, containing 1(2) woody pyrene(s) by abortion; pyrene ellipsoidal, 1-seeded; endosperm almost absent to copious.

Species 7, 6 in humid W and C Africa, 1 in SE Asia; sthn trop. Afr. 5, Angola.

Klainedoxa Pierre ex Engl.

Engler: 227 (1896); Engler: 396 (1931); Exell & Mendonça: 279 (1951); Gilbert: 109 (1958); Keay: 693 (1958); Aubréville: 21 (1962); White: 171 (1962) as *Klaineodoxa*; Exell: 220 (1963); Gentry: 166 (1984); Harris: 152 (1996); Harris: 5 (1999); Phiri (Unpublished) as *Clainedoxa*.

Trees, often very tall; young trees armed with spines up to 100 mm long. **Leaves** coriaceous; stipules usually longer than 50 mm, falcate. **Flowers** bisexual. **Sepals** free, ovate. **Petals** elliptic, 2 or 3 times as long as calyx. **Stamens** (9)10, antepetalous ones shorter than antesepalous ones; pollen with polar triangle. **Ovary** (4)5-locular, slightly sunk into fleshy disc. **Fruit** a depressed, hard, ± distinctly (4)5-lobed drupe containing (4)5 hard, 1-seeded pyrenes, irregularly shaped with processes, free or centripetally fused. **Seeds**: endosperm copious.

Species 2, forested region of W and C Africa; sthn trop. Afr. 1: *Klainedoxa gabonensis* Pierre ex Engl., Angola, Zambia.

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Ixonanthaceae

(Rosidae—Linales)
(Eurosids I—Malpighiales)

Trees, shrubs or rarely suffrutices, glabrous or with an indumentum of simple hairs. **Leaves** alternate, simple, entire or toothed, penninerved; stipules small or 0. **Flowers** bisexual, ± regular, ± hypogynous, small, in axillary cymes or racemes. **Sepals** 5, free or united at base, imbricate. **Petals** 5, free, contorted in bud, persistent, often becoming indurated. **Stamens** 5 or 5 + 5, all fertile; filaments arising on outer side of ring- or cup-like disc, either free or basally attached to disc; anthers 2-thecous, dorsifixed, dehiscing longitudinally; filaments and style folded in bud. **Ovary** superior, 5-locular, each locule with (1)2 ovules and often ± divided by a false septum; ovules, if 2, collateral, pendulous from an apical-axile placenta, anatropous, bitegmic; style terminal, completely united; stigmas 5, free and radiating or united to form a globular mass. **Fruit** a coriaceous to woody, septicidal capsule, each valve frequently splitting at apex along false septum. **Seeds** 1–3(5), ellipsoid, smooth, surrounded by a yellowish or reddish aril; endosperm fleshy; embryo often oblique or lateral.

Genera 4, species 23, trop. Africa, SE Asia, tropical America; sthn trop. Afr. genus 1, species 3. Winkler: 123 (1931) placed the trop. African genus *Phyllocosmus* under the American *Ochthocosmus* in the subfamily Ixonanthoideae of Linaceae. Exell & Mendonça: 105 (1951a) raised the subfamily to family level, but still placed the African species under *Ochthocosmus*. Robson: 100 (1963) followed them. Robson & Gonçalves: 1 (1969) and Verdcourt: 1 (1984) put the African species under *Phyllocosmus* and consider Irvingiaceae, often placed as a subfamily under Simaroubaceae, to belong under Ixonanthaceae.

The Ameriean genus differs from *Phyllocosmus* in its elongate pointed eapsule with dry walls and particularly in its flattened, winged seeds (Verdcourt: 3; 1984).

Bentham: 242, 245 (1862) as tribe Ixonantheae under Lineae; Exell & Mendonça: 105 (1951a); Robson: 100 (1963); Robson & Gonçalves: 1 (1969); Verdeourt: 1 (1984); Takhtajaň: 321 (1997).

Phyllocosmus Klotzsch

Klotzseh: 232 (1857); Robson & Gonçalves: 1 (1969); Exell: 145 (1970). Verdeourt: 1 (1984); Lebrun & Stork: 766 (2003).

Ochthocosmus Benth. in part, as to African speeies; Winkler: 123 (1931); Exell & Mendonça: 105 (1951a); Exell & Mendonça: 246 (1951b); Keay: 355 (1958); White: 167 (1962); Robson: 100 (1963); Phiri (Unpublished) under Irvingiaeeae.

Description as for family.

Speeies 5, trop. Afriea; sthn trop. Afr. 3, Angola, Zambia, Malawi, Mozambique.

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Kirkiaceae
(Simaroubaceae in part)
(Rosidae—Sapindales)
(Eurosids II—Sapindales)

Areher, R.H. in Leistner: 322 (2000).

Sthn trop. Afr.: genus 1, speeies 1.

Kirkia Oliv.

Exell & Mendonça: 276 (1951); White: 172 (1962); Wild & Phipps: 214 (1963); Wild *et al.*: 3 (1969); Stannard: 829 (1981); Takhtajan: 312 (1997); Stannard: 3 (2000); (in all preceding referenees *Kirkia* is placed in Simaroubaeeae); Coates Palgrave: 423 (2002); Angiosperm Phylogeny Group: 420 (2003).

Sthn trop. Afr. 1: *Kirkia acuminata* Oliv., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Differs from Simaroubaeeae in wood anatomy, aestivation of petals, pollen morphology, fruit morphology and seed anatomy [(Takhtajan (1997)].

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Lamiaceae
(Labiatae)
(Asteridae—Lamiales)
(Euasterids I—Lamiales)

Retief, E. in Leistner: 323 (2000).

Sthn trop. Afr.: genera 41, speeies 360.

Key to genera

[partly after Codd (1985), Paton & Ryding (1998), Retief (2000) and Paton (pers. com.)]

1a Fruit dry and hard, turbinate, flat above, with 4 small horns in a cross, at length dividing into 4 pyrenes; calyx accrescent to form a plate-like structure in fruit ..... **Karomia**

1b Fruit a drupe or composed of nutlets; calyx sometimes accrescent in fruit but not as above:

2a Fruit a drupe, remaining undivided or dividing very late in development; style terminal or subterminal:

3a Leaves palmately compound with (1–)3–5 leaflets ..... **Vitex**

3b Leaves simple:

4a Fruit an entire drupe containing a single, 4-locular pyrene ..... **Premna**

4b Fruit a 4-lobed or -furrowed drupe with 4 pyrenes:

5a Flower bud symmetric or, if asymmetric, usually expanding abruptly on upper side due to resupination; anterior corolla lobe only slightly (if at all) larger than the others; anthers dorsifixed; stigma lobes equal ..... **Clerodendrum**

5b Flower bud markedly asymmetric, corolla expanding abruptly on lower side only; anterior corolla lobe frequently much larger than the other 4; anthers usually basifixed (occasionally approaching dorsifixed); stigma lobes frequently unequal ..... **Rotheca**

2b Fruit composed of 4 (or by abortion fewer) nutlets; style gynobasic:

6a Stamens directed upwards or in different directions, never all directed downwards upon the lower side of the tube or the lower lip of the corolla (stamens absent in female flowers of *Tetradenia*):

7a Stamens exserted; filaments with dense moniliform hairs in upper part; anthers 1-thecate ..... **Pogostemon**

7b Stamens included to exserted; filaments ± glabrous; anthers 2-thecous or ± 1-thecous by confluence, or pollen sacs separated by prolongation of connective:

8a Fertile stamens 2; anther thecae separated by a long connective; calyx 2-lipped ..... **Salvia**

8b Fertile stamens 4; anther thecae not widely separated; calyx 2-lipped or 5–many-toothed:

9a Stamens directed in different directions, filaments straight, 2 directed upwards and 2 downwards; corolla small, 2–5 mm long, subequally 4- or 5-lobed (stamens absent in female flowers of *Tetradenia*):

10a Perennial rhizomatous herbs; flowers bisexual ..... **Mentha**

10b Semisucculent or softly woody shrubs, usually flowering after the leaves are shed; plants dioecious ..... **Tetradenia**

9b Stamens all directed to upper side of tube or upper lip of corolla; corolla mostly longer than 5 mm (sometimes shorter in *Scutellaria* but then calyx 2-lipped with upper lip deciduous):

11a Calyx 2-lipped, pouch-shaped or becoming inflated and bladdery in fruit:

12a Corolla ± equally 2-lipped; calyx not much enlarging in fruit, with lips entire, equal in length, the upper one deciduous; nutlets not winged ..... **Scutellaria**

12b Corolla very unequally 2-lipped, often liver-coloured, with upper lip short, broad, ascending; lower lip much larger, 3-lobed; nuts appearing winged due to stiff primary rays interlaced with fine transverse hairs ..... **Tinnea**

11b Calyx regularly or irregularly 5–many-toothed, mouth sometimes oblique but not distinctly 2-lipped (obscurely 2-lipped in some *Leucas* species, but then calyx 6–10-toothed):

13a Corolla usually orange or yellow, rarely cream; upper lobe 12–30 mm long; calyx 8–10-toothed ..... **Leonotis**

13b Corolla not orange or yellow; upper lobe shorter than 10 mm:

14a Stamens included in corolla tube; anthers and style held together by intermingling hairs; calyx glabrous within ..... **Acrotome**

14b Stamens reaching mouth of corolla tube or exserted (stamens included in cleistogamous flowers of **Lamium amplexicaule* but then bracts amplexicaul):

15a Calyx 6–many-toothed (teeth often very unequal in size) ..... **Leucas**

15b Calyx subequally 5-toothed:

16a Calyx 13(–15)-ribbed; stamens arising near corolla throat with very short upcurved filaments ..... **Satureja**

16b Calyx 5–10-ribbed; stamens arising within corolla and usually well exserted:

17a Bracts large, amplexicaul ..... ***Lamium**

17b Bracts leaf-like, or reduced or ovate, sessile and covering the axis between the verticils, not amplexicaul:

18a Bracts ovate, sessile, cuspidate, sparsely pubescent with ciliate margin covering the axis between the verticils ..... **Achyrospermum**

18b Bracts leaf-like or reduced:

19a Bracts leaf-like; calyx often with additional smaller teeth (5–8-toothed); upper lip of corolla subequal to lower one and beset with stiff, brush-like hairs ..... **Leucas**

19b Bracts usually reduced, occasionally leaf-like; calyx always 5-toothed; upper lip of corolla glabrous or pubescent but not with stiff brush-like hairs, usually shorter than horizontal lower lip ..... **Stachys**

6b Stamens directed downwards upon the lower side of the corolla tube or the lower lip of the corolla:

20a Lower lip of the corolla thickened at the base and reflexing at anthesis to explosively release the stamens; calyx teeth linear-subulate; corolla small, ± equally 5-lobed, lower lip thickened at base ..... ***Hyptis**

20b Lower lip of the corolla not thickened at the base, very rarely reflexing at anthesis:

21a Calyx fleshy; only lower 2 stamens fertile, upper 2 minute ..... **Hoslundia**

21b Calyx not fleshy; all 4 stamens fertile, or if upper 2 sterile, then not minute:

22a Stamens arising close together near the throat of the corolla:

23a Calyx inflated and bladdery in fruit ..... **Alvesia**

23b Calyx not much enlarged in fruit, neither fleshy nor inflated; all 4 stamens fertile:
24a Calyx falling away by a clean break above the base of the fruit ..... **Aeollanthus**
24b Calyx persistent in fruit, 3–5-toothed or 2-lipped:
25a Calyx with 5 equal, rigid, spine-like teeth; flowers in a dense, terminal, spike-like inflorescence ..... **Pycnostachys**
25b Calyx not rigidly spinescent:
26a Calyx equally or subequally 5-toothed, uppermost tooth sometimes slightly larger than the other 4:
27a Bracts differentiated from and smaller than the leaves:
28a Style with entire stigma; inflorescence paniculate with slender branches somewhat zigzag towards ends and bearing solitary flowers ..... **Holostylon**
28b Style bilobed; inflorescence paniculate or subspicate with flowers in verticils of (1–)3–many-flowered cymes or dichasia ..... **Plectranthus** sens. lat. (including **Isodictyophorus** and **Leocus**)
27b Bracts leaf-like, becoming gradually smaller towards the apex of the inflorescence or towards the ends of flower-bearing stems:
29a Stems semiwoody, erect; inflorescence dense, paniculate or spicate; flowers in 6–8-flowered verticils arranged in short lateral and terminal spikes ..... **Neohyptis** (best in **Plectranthus**)
29b Stems softly herbaceous, decumbent or erect; flowers in slender, lax, axillary racemes borne along almost entire length of stem ..... **Englerastrum**
26b Calyx ± clearly 2-lipped; upper lip of calyx consisting of a large, oblong to broadly oblong lobe often decurrent on the tube, distinctly larger than the remaining teeth/lobes ..... **Plectranthus** sens. lat. (including **Solenostemon** and **Symphostemon**)
22b Stamens separated by a clear gap at the point of origin in the corolla tube; the lower pair usually arises near the corolla throat, the upper one ± in the middle of the tube or nearer the base, or if near the throat, then on the upper rather than the lower side of the tube:
30a Calyx urceolate-campanulate or very obscurely 2-lipped with a 3-toothed upper and a 2-toothed lower lip; cymes pedunculate with pedicellate flowers; upper stamens arising ± in the middle of the corolla tube ..... **Isodon**
30b Calyx with a single-lobed upper lip and a usually 4-lobed lower lip (rarely 3- or 7-lobed); if equally 5-lobed then cymes sessile, condensed and lacking bracteoles:
31a Corolla with 4 subequal or slightly unequal lobes, not distinctly 2-lipped; stamens included in the corolla tube ..... **Endostemon**
31b Corolla either distinctly 2-lipped or subequally 5-toothed; stamens exserted:
32a Lower pair of stamens united for most of their length, upper pair free ..... **Syncolostemon**
32b Lower and upper pairs of stamens free or all shortly united at the base:
33a Calyx equally or subequally 5-toothed ..... **Benguellia**
33b Calyx 2-lipped:
34a Upper lip of calyx 3-toothed (teeth sometimes minute), lower lip 2-toothed or entire:
35a Inflorescence corymbose, flower heads capitate, 8–10 mm long and almost equally broad .. **Haumaniastrum**
35b Inflorescence spike-like, 50–100 mm long; flowers in dense, many-flowered cymose clusters ..... **Platostoma**
34b Upper lip of calyx consisting of a large, oblong to broadly oblong lobe often decurrent on the tube, distinctly larger than the remaining teeth/lobes:
36a Upper pair of filaments with a crested or hairy knee-bend near the base ..... **Ocimum**
36b Upper pair of filaments glabrous or pubescent but without a crested and hairy knee-bend near the base:
37a Filaments of lower pair of stamens connate for part of their length; upper pair attached to the corolla tube and free ..... **Hemizygia**
37b Filaments all free or all connate at the base:
38a Corolla ± 2 mm long, obscurely 2-lipped, lower lip almost flat ..... **Basilicum**
38b Corolla 4 mm long or longer, 2-lipped; lower lip concave to boat-shaped:
39a All 4 stamens fertile ..... **Orthosiphon**
39b Upper pair of stamens sterile ..... **Fuerstia**

Achyrospermum Blume

Blume: 840 (1826); Baker: 463 (1900); Bruce: 47 (1936); Morton: 261 (1962); Chikuni: 605 (1995); White *et al.*: 293 (2001); Coates Palgrave: 995 (2002).

Perennial herbs or subshrubs; stems quadrangular to subterete. **Leaves** petiolate, thin, crenate. **Inflorescences** of small flowers in dense, terminal or lateral spike-like panicles; bracts ovate, sessile, membranous, ciliate, much smaller than leaves, persistent. **Calyx**: tube subcylindric to funnel-shaped, 10-nerved; teeth 5, subequal, herbaceous, not rigid. **Corolla**: tube funnel-shaped to cylindric; limb bilabiate, upper lip short, curved, lower lip longer, deflexed, 3-lobed. **Stamens** 4, didynamous, curved, lowest pair the longest; anther thecae distinct or confluent. **Style** bifid at apex. **Nutlets** obovoid, reticulate, scaly at apex.

Species ± 25, tropical and subtropical Old World; sthn trop. Afr. 7, Angola, Zambia, Malawi, Mozambique; fide Chikuni (1995) also in sthn Afr.

Acrotome Benth.

Taylor: 1 (1935); Codd: 19 (1985); Mapaura (Unpublished).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Aeollanthus Mart. ex K.Spreng.

Good & Taylor: 165 (1931) as *Aeolanthus*; Codd: 121 (1985); Ryding: 52

(1986); Percy-Lancaster & Richards: 75 (1992); Ryding: 755 (2002).

Icomum Hua; Binns: 57 (1968).

Species 43, tropical and southern Africa; sthn trop. Afr. 27, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Alvesia Welw.

Welwitsch: 55 (1869); Baker: 378 (1900); Binns: 56 (1968); Mathew: 564 (1972).

Plectranthastrum T.C.E.Fr.: 296 (1924); Mathew: 407 (1971); Bingham & Smith: 153 (2002).

Perennial pubescent herbs or subshrubs with woody base; stem and branches ± terete at base, faintly 4-angular towards apex. **Leaves** ± sessile or petiolate, oblong-lanceolate to broadly ovate, acute, ± entire or serrate. **Inflorescences** ± dense terminal racemes with pedicellate flowers in 3–6-flowered verticils; bracts ovate, persistent. **Calyx** densely pubescent, 2-lipped, 3-lobed; upper lobe ovate, lower lobes ± orbicular, or with a campanulate tube and very small obtuse lobes; in fruit large, scarious, inflated and ± closed at mouth. **Corolla** bilabiate, outside densely pubescent; tube short, widening abruptly into an oblique dilated throat; upper lip much shorter than lower, ovate, emarginate or 3-lobed; lower lip large, oblong, carinate, directed far forward. **Stamens** 4, didynamous, declinate, exserted or included in lower lip; filaments free; anthers synthecate. **Disc** entire or shortly lobed. **Style** shortly bifid. **Nutlets** subreniform to subglobose, granular.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Malawi.

Basilicum Moench

Morton: 238 (1962); Morton: 454 (1963); Binns: 56 (1968); Codd: 217 (1985); Mapaura (2002); Phiri (Unpublished).

Moschosma Rchb. in part; Binns: 58 (1968).

Sthn trop. Afr. 1: *Basilicum polystachyon* (L.) Moench, Zambia, Zimbabwe, Malawi, and sthn Afr.

Benguellia G.Taylor

Taylor in Good & Taylor: 156 (1931); Paton: 262 (1997a).

Orthosiphon lanceolatus Gürke: 360 (1903).

Perennial marsh herbs with erect, simple to sparsely branched glabrous stems. **Leaves** opposite, narrowly lanceolate to linear, narrowing very gradually into a short petiole, ± entire but shallowly dentate towards tip, acute, glabrous on both sides but with glandular dots. **Inflorescences** terminal, with numerous 4–6-flowered verticils densely to loosely arranged on a simple straight rachis; bracts sessile, broadly ovate. **Calyx** tubular at flowering time, 10-nerved with 5 ± equal, short, triangular teeth; accrescent and narrowly campanulate in fruit. **Corolla** 2-lipped; tube much longer than calyx, widening slightly towards the mouth; posterior lobe 3-fid, anterior lobe entire, slightly concave. **Stamens** 4, declinate, shortly exserted; anterior stamens arising at corolla throat; posterior ones at midpoint of corolla; filaments free. **Style** slightly exserted, ending in 2 short, flattened, rounded lobes.

Monotypic genus: *Benguellia lanceolata* (Gürke) G.Taylor, known only from Angola.

Clerodendrum L.

Thomas: 1 (1936) under Verbenaceae; Burtt Davy *et al.*: 101 (1958) as *Clerodendron* under Verbenaceae; Verdcourt: 84 (1992) under Verbenaceae; Martins: 63 (1994) as *Clerodendron*; Fernandes: 5 (1998) under Verbenaceae; White *et al.*: 585 (2001) under Verbenaceae; Coates Palgrave: 988 (2002); Mapaura & Timberlake: 169 (2002) as *Clerodendron* under Verbenaceae.

Kalaharia Baill.; Burtt Davy *et al.*: 101 (1958); White: 368 (1962) as synonym.

Sthn trop. Afr. ± 48, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Endostemon N.E.Br.

Morton: 237 (1962); Codd: 127 (1985); Paton *et al.*: 673 (1994).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Englerastrum Briq.

Alston: 295 (1926); Morton: 257 (1962); Codd: 245 (1971); Codd: 177 (1985). Mapaura (Unpublished).

Sthn trop. Afr. ?2, Angola, Zambia, Zimbabwe, and sthn Afr. Generic limits in genera closely related to *Plectranthus*, such as *Englerastrum*, are not all clearly defined. Paton (pers. com.) suggests that *Englerastrum* should be placed under *Plectranthus*.

Fuerstia T.C.E.Fr.

Fries: 28 (1929); Taylor: 269 (1932); Paton: 129 (1993); Paton: 150 (1995a).

Perennial herbs with a woody rootstock or subshrubs, glandular pubescent; stem erect to ascending, quadrangular at least in younger parts. **Leaves** opposite or 3- or 4-nate, sessile or shortly petiolate. **Inflorescences** simple, terminal or axillary racemes with flowers arranged in 2–4-flowered verticils; flowers pedicellate. **Calyx** 2-lipped, shortly tubular, small and semi-erect during flowering, accrescent and declinate in fruit; upper lip broad, ovate, shortly decurrent, lower lip 2- or 4-lobed, lobes deltoid to subulate. **Corolla** 2-lipped; tube straight, not or only slightly exserted from calyx tube; upper lip 4-lobed, lower lip horizontal or deflexed, slightly concave, ± as long as upper one; bracts subtending a single flower. **Stamens** 4, declinate, but posterior 2 sterile, arising near midpoint of corolla; anterior 2 fertile, arising near corolla throat; filaments free; anthers dorsifixed, synthecate, held within basal part of corolla lip. **Ovary** 4-lobed; style curved, 2-lobed at apex. **Nutlets** basifixed, surrounded by a 4-lobed disc.

Species ± 9, trop. Africa; sthn trop. Afr. 6, Angola, Zambia. Very close to *Orthosiphon* and perhaps best recognised as a section within *O.* subgenus *Orthosiphon* (Paton 1993: 130).

Haumaniastrum P.A.Duvign. & Plancke

Duvigneaud & Plancke: 222 (1959); Morton: 239 (1962); Paton: 257 (1997a); Paton: 298 (1997b).

Acrocephalus Benth. in part, as to African and Madagascan species; Codd: 213 (1985); Retief: 325 (2000).

Species 35, tropical and southern Africa, with centre of diversity in S Zaïre; sthn trop. Afr. 19, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hemizygia (Benth.) Briq.

Ashby: 312 (1935); Morton: 239 (1962); Wild: 149 (1964); Codd: 1 (1976); Codd:193 (1985).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Holostylon Robyns & J.-P.Lebrun

Good & Taylor: 161 (1931); Binns: 57 (1968); Codd: 173 (1985); Mapaura (Unpublished).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr. Paton (pers. com.) suggests that *Holostylon* should be placed under *Plectranthus*.

Hoslundia Vahl

Hiern: 860 (1900); Binns: 57 (1968); Codd: 183 (1985); Mapaura (unpublished).

Monotypic genus: *Hoslundia opposita* Vahl, sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*__Hyptis__ Jacq.

White: 372 (1962); Binns: 57 (1968); Codd: 117 (1985); Scott *et al.*: 25 (1994), Mapaura (Unpublished).

Mesosphaerum P.Browne; Hiern: 872 (1900).

Sthn trop. Afr. 3 or 4 species, native of tropical America, widespread weeds in trop. Africa, including Angola, Zambia, Zimbabwe, Malawi, and sthn Afr. One of them, *Hyptis pectinata* (L.) Poit., is apparently indigenous in trop. Africa (Codd 1985: 117).

Isodictyophorus Briq.

Briquet: 285 (1917); Morton: 465 (1963); Agnew: 640 (1974); Guillaumet & Cornet: 528 (1976).

Erect subshrubs; stems quadrangular, whitish-woolly when young. **Leaves** opposite, petiolate, lanceolate, crenulate, glabrous above, pubescent and glandular-punctate beneath. **Inflorescences** terminal panicles or racemes; pedicels slender, crowded at nodes, often branched. **Calyx** with all teeth ± equal, triangular and 3-nerved, ± as long as tube; mature calyx broadly campanulate, ± regular. **Corolla** 2-lipped; lower lip boat-shaped, very broad, with 2 small lateral lobes, upper lip usually 4-lobed, shorter than lower one. **Stamens** 4, declinate, arising at corolla mouth; anther synthecate. **Style** lying with stamens in lower lip of corolla; stigma shortly 2-lobed. **Nutlets** ovoid or oblong, smooth.

Species 3, tropical W Africa and Madagascar; sthn trop. Afr. 1: *Isodictyophorus reticulatus* (A.Chev.) J.K.Morton. Paton (pers. com.) suggests that *Isodictyophorus* should be placed under *Plectranthus*.

Isodon (Schrad. ex Benth.) Spach

Spach: 162 (1838); Codd: 7 (1984); Li: 289 (1988); Paton & Ryding: 723 (1998); Phiri (Unpublished).

Homalocheilos J.K.Morton: 268, 249 (1962). *Plectranthus* L'Hér. in part; Binns: 59 (1968). *Rabdosia* Hassk.; Codd: 117 (1973).

Perennial herbs or subshrubs, much branched; stems and branches acutely quadrangular. **Leaves** shortly petiolate to subsessile, ovate to oblong-ovate, acute, rounded at base, dentate to crenulate. **Inflorescences** ample, dichotomously branched, axillary and terminal panicles; bracts not sharply differentiated from leaves; bracteoles linear, very small. **Calyx** urceolate-campanulate, sometimes obscurely separated into a 3-toothed upper lip and a 2-toothed lower lip; teeth subequal, triangular. **Corolla** 2-lipped; tube relatively straight, not markedly ventricose or saccate at base; upper lip reflexed, 4-fid at apex, lower lip broadly ovate, almost flat. **Stamens** 4, declinate; posterior one arising near base; anterior one arising at mouth of corolla tube, exserted; filaments all free to base; anthers synthecate, ovate. **Style** far exserted; stigma minutely 2-lobed.

Species ± 100, tropical and subtropical Asia, and 1: *Isodon ramosissimum* (Hook.f.) Codd in tropical Afr.; sthn trop. Afr.: Malawi, Zimbabwe.

Karomia Dop

Fernandes: 36 (1985) under Verbenaceae; Verdcourt: 82 (1992) under Verbenaceae; Coates Palgrave: 992 (2002).

Holmskioldia Retz. as to African and Madagascar species; White: 368 (1962); Fernandes: 33 (1985).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*__Lamium__ L.

Codd: 47 (1985).

Sthn trop. Afr. 1: **Lamium amplexicaule* (L.) Benth., a native of Europe, is now a widespread weed, also in sthn Afr.

Leocus A.Chev.

Chevalier: 125 (1909); Morton: 251, 270 (1962); Morton: 461 (1963).

Briquetastrum Robyns & Lebrun; White: 372 (1962).

Perennial herbs with quadrangular, pubescent stems. **Leaves** lyrate-oblanceolate, ± auricled on stem. **Inflorescence** terminal, pseudospicate, dense; bracts small, early caducous. **Calyx**: tube bulbous; teeth 5: 4 ± as long as tube, lanceolate, upper tooth larger, narrowly lanceolate, acuminate. **Corolla** 2-lipped, pubescent; lower lip carinate. **Stamens** 4, declinate, with filaments fused into a tube arising at corolla throat; anthers synthecate. **Style** lying with stamens in lower lip of corolla; stigma shortly 2-lobed. **Nutlets** ovoid, smooth.

Species 5, trop. Africa; sthn trop. Afr. ?1: *Leocus lyratus* A.Chev., Zambia, Zimbabwe. Paton (pers. com.) states that *Leocus lyratus* is so similar to *Plectranthus betonicifolius* that there appears to be no reason to keep *Leocus* separate from *Plectranthus*.

Leonotis (Pers.) R.Br.

Hiern: 879 (1900); Binns: 58 (1968); Iwarsson: 31 (1985); White *et al.*: 294 (2001).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Leucas R.Br.

Hiern: 876 (1900); Burtt Davy *et al.*: 58 (1958); White: 372 (1962); Binns:

58 (1968); Sebald: 1 (1980); Codd: 39 (1985) Ryding: 235 (1998); Mapaura & Timberlake: 165 (2002); Mapaura (Unpublished).

Lasiocorys Benth.; Buscalioni & Muschler: 483 (1913); Wild: 78 (1965).

Sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mentha L.

Hiern: 873 (1900); Gürke: 354 (1903); Codd: 107 (1985).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Neohyptis J.K.Morton

Morton: 272, 258 (1962); Morton: 465 (1963); Codd: 135 (1985); Mapaura (Unpublished).

Annual herbs, sparingly branched; stems erect or decumbent, quadrangular. **Leaves** sessile, ovate to ovate-lanceolate, apex subacute, base obtuse, margin obscurely crenate, glabrous above, hispidulous on nerves beneath. **Inflorescence** of short, dense, spike-like racemes borne terminally and in axils of leaves in upper half of stem; bracts persistent. **Calyx** tubular-campanulate, slightly ventricose when mature, equally 5-toothed; teeth lanceolate, acute. **Corolla** 2-lipped; tube straight; upper lip erect, 4-lobed; lower lip concave, spreading. **Stamens** 4, didynamous, declinate, not exceeding lower corolla lip; filaments fused in pairs towards base, arising in throat. **Nutlets** small, glabrous.

Monotypic genus: *Neohyptis paniculata* (Baker) J.K.Morton, (=*Geniosporum paniculatum* Baker), trop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, and sthn Afr. Paton (pers. com.) suggests that *Neohyptis* should be placed under *Plectranthus*.

Ocimum L.

Morton: 232 (1962); Binns: 58 (1968); Codd: 219 (1985); Paton: 403 (1992); Paton & Putievsky: 509 (1996); Paton *et al.*: 1 (1999).

Becium Lindl.; Morton: 237 (1962); Codd: 223 (1985); Paton: 199 (1995b).

Sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Orthosiphon Benth.

Hiern: 858 (1900); Morton: 238 (1962); Binns: 59 (1968); Codd: 229 (1985); Paton: 147 (1995a).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Platostoma P.Beauv.

Palisot de Beauvois: 61 (1818); Morton: 237 (1962); Binns: 59 (1968) as *Platystoma*; Paton: 257 (1997a).

Geniosporum Wall. ex Benth. in part; Baker: 350 (1900); Morton: 238 (1962); Codd: 215 (1985). *Limniboza* R.E.Fr.: 277 (1916); Lisowski: 462 (1987).

Annual or perennial herbs; stems arising from a tap root, a slender rhizome or a small woody rootstock. **Leaves**: upper ones and bracts basally pale or coloured. **Inflorescence** lax or condensed; verticils composed of opposite cymes; cymes usually more than 3-flowered. **Calyx** round in cross section; posterior lip 1- or 3-lobed with posterior lip decurrent or not, anterior lip 1–5-lobed. **Corolla** 2-lipped, curved, dorsally gibbous or spurred; posterior lip 3- or 4-lobed, ascending, anterior lobe horizontal. **Stamens** 4, declinate or spreading; posterior ones arising at midpoint of corolla; anterior ones arising near corolla throat; filaments basally swollen and often pubescent; anthers syntheeate. **Style** bifid. **Nutlets** minutely striate or reticulate, apically pubescent or not.

Species 45, Old World tropics, 11 in trop. Africa, of which 6 are found in sthn trop. Afr. in Angola, Zambia, Zimbabwe, Malawi, ?Mozambique, and in sthn Afr.

Plectranthus L'Hér.

Good & Taylor: 156 (1931); Morton: 242 (1962); Binns: 59 (1968); Codd: 371 (1975); Mathew: 174 (1976); Codd: 137 (1985); Brummitt & Seyani: 687 (1987); Paton & Brummitt: 523 (1991); Percy-Lancaster & Richards: 75 (1992); Edwards *et al.*: 459 (2000); Retief: 330 (2000); Edwards *et al.*: 201 (2001); White *et al.*: 295 (2001); Msekandiana & Mlangeni: 36 (2002); Mapaura (Unpublished).

Ascocarydion G.Taylor in Good & Taylor: 162 (1931). *Coleus* Lour.: 372 (1790); Burtt Davy *et al.*: 58 (1958); Binns: 57 (1968). *Germanea* Lam.; Hiern: 860 (1900). *Rabdosiella* Codd: 7 (1984).

Sthn trop. Afr. ± 70, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Paton (pers. com.) suggests that *Englerastrum*, *Holostylon*, *Isodictyophorus*, *Leocus*, *Neohyptis*, *Solenostemon* and *Symphostemon* should be included under *Plectranthus*.

Pogostemon Desf.

Desfontaines: 154 (1815); Good & Taylor: 166 (1931); Cantino *et al.*: 511 (1992); Bhatti & Ingrouille: 8 (1996); Bhatti & Ingrouille: 77 (1997); Ingrouille & Bhatti (1998).

Geniosporum Wall. ex Benth. in part; Hiern: 854 (1900).

Amphibious or aquatic perennial herbs with spreading rhizome or polycephalic rootstock; stem weak, terete or angular; with 4-celled hairs. **Leaves** in opposite pairs, petiolate, ovate or elliptic, base cuneate, apex acute, margin serrate or dentate; hairs 3- or 6-celled. **Inflorescence** a dense terminal spike, simple or branched, with 2- or 4-celled hairs. **Calyx** campanulate, 5- or 10-veined, densely hairy to ± glabrous outside; teeth 5, ciliate, hairy within. **Corolla** 4-lobed, 3 lobes forming upper lip, lower lip single-lobed. **Stamens** 4, all exserted; filaments bearded with dense moniliform hairs towards middle, arising at different heights in corolla tube; anthers 1-thecous. **Style** exserted; stigma 2-lobed. **Nutlets** 4, ± ellipsoid, reticulate-foveate.

Species 90–100, essentially Asian, with 2 species in W trop. Africa; sthn trop. Afr. 2, Angola.

Premna L.

Hiern: 831 (1900); Fernandes: 297 (1990) under Verbenaceae; Verdcourt: 702 (1990); Verdcourt: 68 (1992) under Verbenaceae; Coates Palgrave: 977 (2002).

Sthn trop. Afr. ± 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pycnostachys Hook.

Bruce: 563 (1940); Morton: 241 (1962); Binns: 60 (1968); Codd: 131 (1985); White *et al.*: 296 (2001).

Sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rotheca Raf.

Rafinesque: 69 (1838); Fernandes: 5 (1998); Steane & Mabberley: 204 (1998); Fernandes & Verdcourt: 147 (2000); Coates Palgrave: 989 (2002); Herman & Retief: 81 (2002).

Clerodendrum L. subgen. *Cyclonema* (Hochst.) B.Thomas: 1 (1936); Verdcourt: 86 (1992).

Shrubs, subshrubs, or pyrophytic herbs, sometimes scandent or decumbent, rarely small trees. **Leaves** usually verticillate, sessile or shortly petiolate, often distinctly crenate or coarsely serrate, sometimes entire. **Inflorescence** cymose, usually leafy, mostly lax, terminal and/or axillary. **Calyx** campanulate to subspherical, divided for half its length or often less, frequently red or purple; lobes 4–6, rounded to narrowly triangular, acute to rounded at apex. **Corolla** irregular, pale to deep blue or a mixture of both, occasionally partly white or yellow; tube 6–12 mm long; basally saccate in front, deeply divided behind at apex; lobes very unequal, forming a ± 2-lipped limb, anterior lip larger and curved. **Ovary** glabrous, glandular or hairy; placentas not furcate.

Species ± 35, tropical and sthn Afr.; sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Salvia L.

Morton: 261 (1962); Binns: 60 (1968); Hedge: 1 (1974); Codd: 79 (1985).

Sthn trop. Afr. 2 indigenous, but several, such as **Salvia coccinea* Etlinger and **S. reflexa* Hornem., cultivated and naturalised, also in sthn Afr.

Satureja L.

Morton: 259 (1962); White: 372 (1962); Binns: 60 (1968); Codd: 103 (1985); Harley: 10 (1996).

Micromeria Benth.: t. 1282 (1829); Baker: 452 (1900); Binns: 58 (1968). *Calamintha* sensu R.D.Good & G.Taylor: 167 (1931).

Sthn trop. Afr. ± 5, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Scutellaria L.

Morton: 261 (1962); Codd: 17 (1985); Paton: 41 (1992); Mapaura (Unpublished).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, and sthn Afr.

Solenostemon Thonn.

Hiern: 863 (1900); Morton: 251 (1962); Codd: 437 (1975); Mathew: 174 (1976); Codd: 179 (1985); White *et al.*: 296 (2001); Mapaura (Unpublished).

Sthn trop. Afr. 5, Angola, Zimbabwe, Malawi, and sthn Afr.

Stachys L.

Morton: 263 (1962); Codd: 51 (1985); Sebsebe: 115 (1993); Harvey & Sebsebe: 353 (1994); Harvey: 433 (1996).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Symphostemon Hiern

Hiern: 867 (1900).

Plectranthus L'Hér. as to *P. insolitus* C.H.Wright: Baker: 419 (1900).

Minutely glandular herbs. **Leaves** opposite, subopposite, subternate and subalternate. **Inflorescences** terminal racemes; pedicels alternate, opposite and subternate, spreading; bracteate at or near base. **Calyx** subbilabiate, obliquely campanulate, gibbous at back of base, 5-cleft, somewhat accrescent in fruit and usually pendulous; teeth unequal, posterior one broadly ovate and obtuse or apiculate, other teeth narrower and acute. **Corolla** bilabiate; tube exserted, shortly cylindric to funnel-shaped, slightly curved and gibbous at back near base, throat wide, scarcely oblique; posterior lip shortly 4-lobed, anterior one longer, boat-shaped, entire, enfolding stamens and style. **Stamens** 4, didynamous, declinate, all fertile, slightly shorter than anterior lip; filaments widening at base and united in a short lamina arising in throat of corolla at base of anterior lip; anthers roundish. **Disc** fleshy, produced into 4 thick obovoid glands beside base of nutlets. **Ovary** 4-partite; style shortly exceeding corolla tube; stigma emarginate at apex. **Nutlets** obovoid, compressed.

Species 1 (2 fide Mabberley 1997: 693), Angola.

Syncolostemon E.Mey.

Codd: 21 (1976); Codd: 185 (1985); Paton: 483 (1998); Coates Palgrave: 994 (2002).

Sthn trop. Afr. 1: *Syncolostemon flabellifolius* (S.Moore) A.J.Paton, Zimbabwe, Mozambique, and sthn Afr.

Tetradenia Benth.

Codd: 177 (1983); Codd: 113 (1985); Ryding: 631 (1993); Coates Palgrave: 993 (2002).

Iboza N.E.Br.: 298 (1910); Burtt Davy *et al.*: 58 (1958); White: 374 (1962); Binns: 57 (1968); *Moschosma* Rchb. in part; Binns: 58 (1968).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tinnea Kotschy & Peyr.

Hiern: 879 (1900); White: 375 (1962); Binns: 60 (1968); Vollesen: 1 (1975); Codd: t. 1814 (1980); Codd:13 (1985).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Vitex L.

Verdcourt: 50 (1992) under Verbenaceae; Martins: 63 (1994) under Verbenaceae; Bredenkamp & Botha: 141 (1996) under Verbenaceae; Sales: 189 (2001); White *et al.*: 588 (2001); Coates Palgrave: 978 (2002).

Premna L. as to *P. colorata* Hiern: 833 (1900).

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Lauraceae

(Magnoliidae—Magnoliales)
(Magnoliids—Laurales)

Jordaan, M. in Leistner: 334 (2000).

Sthn trop. Afr.: genera 5, species 13.

White *et al.*: 302 (2001) state that **Persea americana* Mill. is locally naturalised in Malawi.

Identification of additional genus using the key by Jordaan in Leistner: 334 (2000): **Beilschmiedia** runs to 2b, and then, as the fruit is naked, to 4a, but as it has alternate leaves it will not run to **Dahlgrenodendron** which has opposite leaves.

Beilschmiedia Nees

Nees von Esenbeck: 61, 69 (1831); Robyns & Wilczek: 459 (1949); Robyns & Wilczek: 197 (1950); White: 58 (1962); Rohwer: 385 (1993); Diniz: 53 (1997); Bingham & Smith: 153 (2002); Lebrun & Stork: 68 (2003).

Trees or shrubs. **Leaves** alternate, occasionally subopposite towards ends of branches, subsessile or petiolate, papyraceous to coriaceous, pinnately nerved. **Inflorescences** terminal and axillary, panicles or racemes or paniculate cymes, few- to many-flowered; bracts ± pubescent, caducous. **Flowers** bisexual; receptacle shortly tubular or cup-shaped. **Tepals** 6(8) in 2 whorls on rim of receptacle, subequal, deciduous. **Stamens** in 4 whorls, 2 outer whorls each of 3(4) fertile stamens with anthers dehiscing introrsely; inner (third) whorl with anthers dehiscing extrorsely or laterally and with a gland on either side at base of filaments, or inner (third) whorl anthers sometimes sterile; innermost (fourth) whorl reduced to 3 staminodes. **Ovary** subglobose to narrowly ellipsoid, sessile, ± immersed in receptacle; narrowed above into a slender style with an obscure stigma. **Fruit** a 1-seeded drupe, subglobose to ovoid or ellipsoid, naked.

Species ± 200, pantropical, ± 80 species in Africa and Madagascar. Robyns & Wilczek (1950) recognise 77 species in tropical continental Africa. However, Verdcourt (1996) suggests that there are probably fewer than this, pointing out that only 2(3) species are recorded from East Africa; sthn trop. Afr. 5, Angola (Cabinda), Zambia.

Cassytha L.

Verdcourt: 14 (1996); Diniz: 46 (1997); Lebrun & Stork: 78 (2003).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cryptocarya R.Br.

Diniz: 49 (1997); White *et al.*: 298 (2001); Verdcourt: 7 (1996); Coates Palgrave: 215 (2002); Lebrun & Stork: 78 (2003).

Sthn trop. Afr. 4, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ocotea Aubl.

Burtt Davy *et al.*: 58 (1958); White: 58 (1962); Verdcourt: 9 (1996); Diniz: 56 (1997); White *et al.*: 300 (2001); Coates Palgrave: 213 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Lecythidaceae

(Dilleniidae—Lecythidales)
(Asterids—Ericales)

Bredenkamp, C.L. in Leistner: 336 (2000).

Additional family characters: Trees (mangroves) or evergreen shrubs with woody rootstock. **Leaves** sometimes with hairy pits in axils of lateral nerves. **Flowers** in racemes, panicles or solitary. **Calyx** 2–5-lobed. **Petals** 0 or 4, if 0, then outer series of staminodes sometimes considered to be a corolla. **Stamens** and **staminodes** many. **Ovary** 2–5-locular, sometimes 4-ridged to 4-winged; style short or longer than stamens; stigma truncate or peltate. **Fruit** sometimes resembling a pomegranate, or 4-winged, 1-, few-, or many-seeded.

Genera 20, species 280, pantropical, especially S American rain forest; segregated into 4 or 5 subfamilies which are sometimes regarded as closely related families (Takhtajan 1997). Two of these occur in the region: Planchonioideae (=Barringtoniaceae) with *Barringtonia* and *Petersianthus*, and Napoleonoideae with *Napoleonaea*. Sthn trop. Afr.: genera 3, species ± 5.

Key to genera

1a Petals 0, but outer series of staminodes forming a showy, pleated. corolla-like, membranous corona; style very short, expanded into a broad peltate stigma; fruit usually several-seeded ..... **Napoleonaea**

1b Petals 4; style long, filiform, with truncate stigma; fruit mostly 1-seeded, sometimes broadly 4-winged:
2a Ovary 4-ridged or -winged; fruit broadly 4-winged; inflorescence a terminal panicle; anther thecae divergent ..... **Petersianthus**
2b Ovary and fruit ± to slightly angled; inflorescence an axillary or terminal raceme; anther thecae parallel ..... **Barringtonia**

Barringtonia J.R.Forst. & G.Forst.

Sangai: 1 (1971); Fernandes: 216 (1978) under Barringtoniaceae; Fernandes: 2 (1980) under Barringtoniaceae; Coates Palgrave: 782 (2002) under Lecythidaceae.

Sthn trop. Afr. 1: *Barringtonia racemosa* (L.) Spreng. Mozambique, and sthn Afr.

Napoleonaea P.Beauv.

Palisot de Beauvois: 1 (1804); White: 274 (1962) as *Napoleona*; Fernandes & Fernandes: 112 (1970) under Barringtoniaceae; Liben: 363 (1971b); Fernandes: 218 (1978) under Barringtoniaceae.

Shrubs, evergreen, with woody rootstock. **Leaves** entire. **Flowers** solitary. **Calyx** 5-lobed, lobes valvate, sometimes with 2(3) marginal glands at apex; tube obconical. **Petals** 0, but outer series of staminodes sometimes considered to be a corolla (Takhtajan 1997). **Stamens** and antherless **staminodes** many, united at base and arranged in 4 series: outermost forming a radiate or cup-shaped pseudocorolla with 20–40 pleats; second of many narrowly ligulate staminodes free or partly united; third of staminodes connate for more than lower half and forming a 20–60-lobed cup with lobes inflexed; fourth connate with third and composed of intermixed staminodes and fertile stamens; anthers 1-thecous, dorsifixed. **Ovary** 5-locular; ovules 2–6 per locule; style short, expanded into a broad, peltate stigma. **Fruit** a drupe, resembling a pomegranate. **Seeds** few.

Species 8, trop. Africa; sthn trop. Afr. 2 or 3, Angola, Zambia.

Petersianthus Merr.

Merrill: 200 (1916); Liben: 207 (1969); Fernandes & Fernandes: 111 (1970) under Barringtoniaceae; Liben: 2 (1971a).

Combretodendron Chev.: 151 (1909); Knuth: 60 (1939); Keay: 242, figure 97 (1954). *Petersia* Welw. ex Benth.; Greves: 176 (1928).

Tall trees. **Leaves** bunched at ends of branches, ± obovate, obscurely irregularly crenate, glabrous underneath, often with large hairy pits in axils of lateral nerves; petiole short, puberulous when young. **Flowers** several in short terminal panicles. **Calyx**: lobes 4, rounded and shortly ciliate. **Petals** 4, hooded, glabrous. **Stamens** fused at base; filaments filiform; anthers 2-thecous, appearing 4-lobed due to divergent thecae, basifixed. **Ovary** 2-locular, 4-ridged to 4-winged; ovules many in 2 rows in each locule; style filiform. **Fruit** broadly 4-winged (as in *Combretum*), almost orbicular, emarginate. **Seeds** 1(–4), fusiform.

Species 2, Philippines, W Africa; sthn trop. Afr. 1: *Petersianthus macrocarpus* (Beauv.) Liben, Angola.

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Leeaceae

(Rosidae—Rhamnales)
(Rosids; included in Vitaceae)

Shrubs or small trees; stems straight, sparsely branched, sometimes producing runners, soft-wooded, glabrous, with many lenticels; tendrils absent. **Leaves** alternate, 2-pinnate or occasionally 3-pinnate at base; petiole long, somewhat swollen, glabrous or pubescent; leaflets 3, 5(7), imparipinnate, opposite, elliptic, acuminate at apex, serrate-dentate; stipules petiolar, very soon caducous. **Flowers** bisexual, regular, small, globose in bud, in leaf-opposed, cymose, often umbelliform inflorescences. **Calyx** 5-lobed, cupular, usually glabrous or rarely pubescent. **Petals** 5, fused at base, becoming reflexed, glabrous. **Stamens** 5, opposite petals, inflexed in bud but exserted and erect in open flower, borne between truncate-emarginate lobes of a tube adnate to base of corolla tube and possessing a downward deflexed sleeve of tissue at about its middle (a complicated structure considered to be derived from fusion of filaments); anthers 2-locular, dorsifixed with ± longitudinal dehiscence. **Disc** apparently absent. **Ovary** superior, 4–6-locular, ovoid, glabrous; 1 anatropous, basal, erect, bitegmic ovule per locule; style cylindric,

short; stigma subcapitate. **Fruit** a depressed-subglobose, 4–6-lobed berry. **Seeds** 4–6, laterally compressed and triangular in transverse section; endosperm ruminate; embryo linear, small.

Genus 1, species 34, Old World tropics; sthn trop. Afr. species 1. Leeaeae is often placed under Vitaceae from which it differs mainly in the fused, not free, filaments, the absence of tendrils, and the 4–6-locular ovary with a single erect ovule per locule.

Dumortier: 21, 27 (1829), name conserved; Wild: 492 (1966); Descoings: 133 (1972); Ridsdale: 73 (1974).

Leea L.

Linnaeus: 608, 627 (1767), name conserved; Exell & Mendonça: 71 (1954/1956) under Vitaceae; Wild: 494 (1966); Descoings: 133 (1972); Verdcourt: 141 (1993); White *et al.*: 303 (2001).

Description as for family.

Species 34, Old World tropics; sthn trop. Afr. 1: *Leea guineensis* G.Don, Angola, Zambia, Malawi.

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Lentibulariaceae
(Asteridae—Scrophulariales)
(Euasterids I—Lamiales)

Smithies, S.J. in Leistner: 336 (2000).

Sthn trop. Afr.: genera 2, species 36.

Genlisea A.St.-Hil.

Exell: 125 (1930); Taylor: 53 (1972); Taylor: 23 (1973); Taylor: 38 (1988); Fischer *et al.*: 291 (2000).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Utricularia L.

Exell: 123 (1930): Taylor: 1 (1964); Taylor: 2 (1972); Taylor: 1 (1986) Taylor: 9 (1988).

Sthn trop. Afr. 28, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Linaceae
(includes Hugoniaceae)
(Rosidae—Linales)
(Eurosids I—Malpighiales)

Bredenkamp, C.L. in Leistner: 337 (2000).

Sthn trop. Afr.: genera 4, species ± 14.

Key to genera

1a Stamens 10, all fertile; woody plants ..... **Hugonia**

1b Stamens 4 or 5; annual or perennial herbs, rarely shrublets; fruit with 4 or more locules:

2a Sepals undivided; flowers 5-merous ..... **Linum**

2b Sepals 3(4)-fid; flowers 4-merous ..... **Radiola**

Hugonia L.

Exell & Mendonça: 243 (1951) in Hugoniaceae; Robson: 91 (1963); Robson & Gonçalves: 2 (1969); White *et al.*: 335 (2001); Coates Palgrave: 401 (2002); Izidine & Bandeira: 51 (2002).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Linum L.

Exell & Mendonça: 242 (1951); Robson: 96 (1963); Robson & Gonçalves: 7 (1969); Exell: 145 (1970); Rogers: 711 (1981); Bingham (Unpublished).

Sthn trop. Afr. 2 indigenous species, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Radiola Hill

Hill: 227 (1756); Robson: 99 (1963).

Herbs, annual, ± spreading, glabrous; stem often purplish red. **Leaves** opposite, sessile, elliptic or lower ones obovate, entire, 1-nerved; stipules absent. **Flowers** in terminal, regularly dichotomous dichasia, homostylic. **Sepals** (2)3(4)-fid, united at base, persistent. **Petals** 4, white, united with stamen filaments to form a very short tube, very shortly unguiculate. **Stamens** 4, with filaments united at base only; staminodes usually absent; nectaries obscure. **Ovary** 4-locular, each locule with 2 pendulous ovules and partially divided by a false septum; styles 4, free; stigmas capitate. **Fruit** a 4-locular, 8-valved capsule with 2-seeded locules; seeds in each locule partially separated by an enlarged false septum. **Seeds** small, with scanty endosperm; embryo straight.

Monotypic genus: *Radiola linoides* Roth, Europe, temperate Asia, trop. African mountains; in sthn trop. Afr.: N Malawi. Closely related to *Linum*.

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Loranthaceae

(Rosidae—Santalales)
(Core Eudicots—Santalales)

Germishuizen, G. in Leistner: 340 (2000).
This account is based very largely on Polhill & Wiens (1998) and Polhill & Wiens (1999).

Sthn trop. Afr.: genera 17, species 108.

Expanded family description: hairs, where present, simple or slightly branched to dendritic or stellate.

Key to genera

[after Polhill & Wiens (1998)]

1a Hairs simple, irregularly branched or absent:
2a Flowers in racemes or spikes, sometimes crowded at apex of peduncle; petals 4, separate, coherent below, radially spreading to reflexed from the middle where the short erect stamens generally arise ..... **Helixanthera**
2b Flowers borne in heads, umbels, clusters or singly; petals not as above:
3a Corolla ± S-shaped, elongate, with marked folds on the inner surfaces of the lower part of the petals or corolla tube; secondary haustoria present on extensive surface runners ..... **Plicosepalus**
3b Corolla gamopetalous with a short to long tube lacking folds inside; plants with a single haustorial attachment:
4a Corolla, when open, with radially arranged lobes spreading and later reflexed, tubular below:
5a Corolla 4-lobed; stamens remaining attached to the style tip by connective appendages ..... **Emelianthe**
5b Corolla 5-lobed; stamens erect to spreading, separate:
6a Filaments curving gently outwards, essentially isodiametric, arising near base of corolla lobes ..... **Pedistylis**
6b Filaments erect, upper part thickened and coiling at anthesis, arising nearly halfway up the corolla lobes ..... **Actinanthella**
4b Corolla opening unilaterally, often with a marked V-slit, sometimes (*Oncocalyx* and *Spragueanella*) the lobes only slightly coherent to one side (at least when seen pressed), but then short tube deeply split:
7a Corolla lobes inrolled at anthesis ..... **Oliverella**
7b Corolla lobes erect, reflexed or rolled outwards at anthesis:
8a Corolla lobes 4; corolla lobes generally half as long as tube or longer ..... **Englerina**
8b Corolla lobes 5:
9a Corolla usually banded with 1–several contrasting colours, with vents opening below the corolla tip in mature buds, the lobes often remaining erect:
10a Corolla lobes much shorter than the tube ..... **Agelanthus**

10b Corolla lobes longer than the tube:
11a Corolla buds straight, with a distinct tube developing a V-split (the other lobes sometimes separating to this point in dried specimens) ..... **Oncocalyx**
11b Corolla buds bent at the base, with a very short tube split to the base without a distinct V ..... **Spragueanella**
9b Corolla reddish, sometimes white or greenish towards the extremities or spotted, with tips of buds swollen and darkening at maturity, without vents below, opening explosively with lobes generally reflexed, rolled outwards or less often remaining erect:
12a Corolla lobes reflexed or rarely erect ..... **Tapinanthus**
12b Corolla lobes coiled outwards at anthesis; anthers small, mostly fitting under the top-shaped to peltate stigma .. **Globimetula**
1b Hairs stellate or dendritic with whorls of branches, rarely present only on youngest parts, sometimes with subsimple hairs admixed:
13a Flowers in extended spikes or racemes:
14a Flowers covered in long subsimple hairs ..... **Erianthemum**
14b Flowers glabrous to tomentellous:
15a Corolla yellow to red without dark markings; tip of corolla bud narrow, enclosing elongate anthers ..... **Oedina**
15b Corolla pink or yellow-orange with dark glandular spots at base of lobes; tip of corolla bud obovoid, enclosing small anthers with unequal thecae ..... **Oncella**
13b Flowers in umbels, clusters or heads, occasionally with a few flowers below the main head, candelabra-like:
16a Corolla opening radially, the lobes as long as to distinctly longer than the tube; filaments arising well up the corolla lobes, elongate, generally articulated and often breaking off near the middle ..... **Erianthemum**
16b Corolla with a short V-slit at anthesis, the lobes shorter than the tube; filaments arising ± at the base of the lobes, short isodiametric, erect or inrolled:
17a Anthers not chambered; secondary haustoria developed on extensive surface runners ..... **Vanwykia**
17b Anthers locellate, the thecae subdivided into a series of small chambers; stems from a single haustorial attachment ..... **Phragmanthera**

Actinanthella Balle

Polhill & Wiens: 99 (1998).

Sthn trop. Afr. 1: *Actinanthella menyharthii* (Engl. & Schinz ex Schinz) Balle, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Agelanthus Tiegh.

Polhill & Wiens: 137 (1998); White *et al.*: 345 (2001).

Sthn trop. Afr. 27, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Emelianthe Danser

Danser: 53 (1933); Polhill & Wiens: 96 (1998); Phiri (Unpublished).

Aerial, hemiparasitic shrubs 0.5–2 m, with a single haustorial attachment, glabrous, fibrous at fractures. **Leaves** mostly alternate and also crowded on short shoots, penninerved. **Flowers** 2–4, umbellate on a short peduncle or clustered on short shoots of generally leafless branches, shortly pedicellate; bract ovate-triangular from a saucer-shaped base. **Calyx** cupular. **Corolla** joined ± halfway, 4-lobed, radially symmetrical, with fluted vents opening at top of tube, not or scarcely explosive, lobes recurving. **Stamens** arising above base of corolla lobes, remaining weakly attached to style tip by a conspicuous bifid connective appendage; anthers 4-thecous.

Monotypic genus: *Emelianthe panganensis* (Engl.) Danser, E and NE Africa; sthn trop. Afr.: Zambia [fide Phiri (Unpublished)].

Englerina Tiegh.

Van Tieghem: 257 (1895); Polhill & Wiens: 119 (1998); White *et al.*: 349 (2001); Izidine & Bandeira: 51 (2002).

Aerial, hemiparasitic shrubs, ± 0.5–2 m high with a single haustorial attachment, glabrous or shortly hairy with simple or slightly branched hairs. **Leaves** opposite or subopposite, sessile to generally petiolate; lamina usually thin but sometimes coriaceous, penninerved. **Inflorescence** a 2–20-flowered pedunculate umbel with flowers standing up like candles from horizontal branches; bract unilaterally developed from a generally shallow cupular base, not or scarcely exceeding ealyx. **Calyx** annular or cup-shaped, sometimes 4-lobed or lacerate. **Corolla** 4-lobed, joined one-fifth to two-thirds, red, yellow, orange or pink and white; buds generally 4-angular, generally slightly swollen over anthers; tube split unilaterally with V-split extending halfway to almost to base. **Filaments** arising at or near base of corolla lobes, free part tapered upwards, involutely curved or coiled at anthesis, produced into a tooth in front of anther; anther 4-thecous. **Style** filiform, 4-angular; stigma obovoid to globular. **Berry** obovoid to urceolate, with persistent calyx, usually red. **Seed** orange or yellow.

Species 25, trop. Africa; sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique. Close to *Agelanthus* which has 5-merous flowers.

Erianthemum Tiegh.

Polhill & Wiens: 234 (1998); White *et al.*: 350 (2001).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Globimetula Tiegh.

Van Tieghem: 244, 264 (1895); Polhill & Wiens: 209 (1998).

Aerial, hemiparasitic shrubs, ± 0.5–2(–4) m high, usually with a single haustorial attachment, but sometimes scandent with many secondary haustoria; glabrous or sometimes with papillae on youngest parts and umbels. **Leaves** opposite, subopposite or ternate, penninerved. **Inflorescence** a 2–20-flowered pedunculate umbel; bracts at base of peduncle and pedicels small, triangular. **Flowers** 5-merous, gamopetalous, bilaterally symmetrical by presence of a unilateral V-shaped slit extending more than halfway to base. **Calyx** subentire, normally ciliolate. **Corolla** with conspicuous basal and apical (sometimes winged) swellings, pink or red, sometimes white to green on lower or upper part;

lobes revolute. **Filaments** involutely curved or coiled at anthesis; anthers 4-thecate with outer pair of thecae shorter and sometimes set lower, connective distinct. **Style** skittle-shaped above; stigma turbinate to peltate. **Berry** depressed-globose to ellipsoid, red to yellow. **Seeds** brightly coloured.

Species 13, trop. Africa; sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Helixanthera Lour.

Polhill & Wiens: 79 (1998).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Oedina Tiegh.

Van Tieghem: 249 (1895); Polhill & Wiens: 225 (1998); White *et al.*: 351 (2001).

Aerial, hemiparasitic shrubs, up to 2 m or more, from a single haustorial attachment; twigs slightly compressed to angular, soon terete; hairs stellate and dendritic. **Leaves** mostly opposite or subopposite, rarely clustered, shortly petiolate, penninerved. **Inflorescence** few- to many-flowered racemes or spikes from axils and older nodes; bract small, unilateral. **Calyx** saucer-shaped to tubular, entire to shortly toothed. **Corolla** 5-lobed, regular to slightly irregular, joined up to halfway, yellow to red, puberulous to hirsute, weakly explosive at anthesis; tube with a slight to marked basal swelling, only rarely with a short V-split at anthesis; lobes usually erect, often partly cohering at tips, occasionally spreading to coiled. **Filaments** arising 6–10 mm above base of corolla lobes, ± articulate, upper part coiling; anthers 4-thecous, basifixed. **Style** filiform; stigma ovoid to fusiform. **Berry**, where known, blue-green, ovoid-ellipsoid to obovoid. **Seed** orange to red.

Species 4, eastern trop. Africa; sthn trop. Afr. 2, Zambia, Malawi.

Oliverella Tiegh.

Polhill & Wiens: 114 (1998).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Oncella Tiegh.

Van Tieghem: 251 (1895); Polhill & Wiens: 230 (1998).

Small aerial, hemiparasitic well-branched shrubs from a single haustorial attachment; twigs slightly compressed to angular, soon terete; hairs stellate and dendritic. **Leaves** opposite or subopposite, shortly petiolate, penninerved. **Inflorescence** a raceme; bracts small, unilateral. **Calyx** short, entire to shortly toothed. **Corolla** 5-lobed, joined halfway, regular, orange to pink or red, with a dark glandular patch at base of each lobe, stellate-pubescent, weakly explosive at anthesis; tube with a basal swelling; tip of bud fusiform to obovoid: lobes usually erect, often partly cohering at tips, occasionally reflexed to coiled. **Filaments** arising ± halfway up corolla lobes, slender in lower persistent part, jointed and slightly thickened above, upper part coiling, breaking off to varying degrees; anthers 4-thecous, basifixed, very short. **Style** filiform; stigma ovoid to obovoid or fusiform. **Fruit** a berry, white to red (sometimes turning black), ellipsoid, with persistent calyx.

Species 4, in eastern trop. Africa, montane and coastal; sthn trop. Afr. 1: *Oncella curviramea* (Engl.) Danser, Malawi, Mozambique.

Oncocalyx Tiegh.

Polhill & Wiens: 101 (1998).

Sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique, and sthn Afr.

Pedistylis Wiens

Polhill & Wiens: 98 (1998).

Sthn trop. Afr. 1, Zimbabwe, Mozambique, and sthn Afr.

Phragmanthera Tiegh.

Polhill & Wiens: 246 (1998); White *et al.*: 352 (2001).

Sthn trop. Afr. 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Plicosepalus Tiegh.

Polhill & Wiens: 87 (1998).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Spragueanella Balle

Balle: 1632 (1954); Polhill & Wiens: 112 (1998).

Small, glabrous, aerial, hemiparasitic shrubs with a single haustorial connection. **Leaves** subopposite, shortly petiolate. **Inflorescence** 2–6-flowered, shortly pedunculate axillary umbels; bract shortly cupular with a small limb with a pouch-like swelling or a spur. **Calyx** cupular to shortly tubular, split by expanding corolla. **Corolla** 5-merous, with a short tube bent in bud, yellow to red, banded green to white, developing vents in mature buds; lobes linear to linear-lanceolate at tips, reflexing below middle at anthesis, sometimes slightly cohering above. **Filaments** arising at base of corolla lobes, erect and filiform below, upper part thickened and inrolled at anthesis; anthers 4-thecous, linear, truncate. **Style** filiform; stigma capitate. **Berry** obovoid.

Species 2, E and SE trop. Africa; sthn trop. Afr. 1: *Spragueanella rhamnifolia* (Engl.) Balle, E Zimbabwe, Malawi, Mozambique. Closely related to *Oncocalyx* but with a very short corolla tube without a V-shaped slit on one side.

Tapinanthus (Blume) Rchb.

Polhill & Wiens: 183 (1998); White *et al.*: 352 (2001).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Vanwykia Wiens

Polhill & Wiens: 221 (1998).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Lythraceae

(Rosidae—Myrtales)
(Rosids—Myrtales)

Bredenkamp, C.L. in Leistner: 344 (2000).

Sthn trop. Afr.: genera 8, species 60.

Additional family characters: Evergreen, glabrous trees or shrubs, growing in mangroves; pneumatophores present. **Flowers** sometimes in 3's, terminal or axillary. **Ovary** multilocular, adnate to calyx tube at base. **Fruit** a multilocular, many-seeded berry surrounded at base by persistent calyx. **Seeds** curved, angular with a thick, coriaceous testa; endosperm 0; embryo with short, leafy cotyledons.

Key to genera

1a Trees or shrubs:
2a Ovary multilocular with many ovules per locule; fruit a multilocular berry with many seeds; growing in mangroves ..... **Sonneratia**
2a Ovary 2–6-locular with 2–many ovules; fruit a capsule or (in *Lawsonia*) indehiscent or irregularly disrupting:
3a Partitions of the ovary complete and then the placenta continuous with the style; flowers 4-merous; stamens (4)8(12); fruit indehiscent; seeds not winged ..... **Lawsonia**
3b Partitions of the ovary interrupted above the placenta, the latter not continuous with the style; flowers 5- or 6-merous; fruit dehiscent; seeds winged:
4a Small trees; flowers 5- or 6-merous, homomorphic, arranged in panicles; calyx turbinate, membranous, with very short folded appendages; stamens 5 or 6; ovary 2-locular; capsule included; seeds thinly winged; leaves minutely pellucid-punctate, with a large gland on the underside of the rounded apex ..... **Galpinia**
4b Shrubs, villous-tomentose; flowers 6-merous, sometimes dimorphic-heterostylous, axillary, solitary or rarely geminate; calyx campanulate, coriaceous, with short, not folded, appendages; stamens 12 or 18; ovary 1-locular; capsule slightly exserted; seeds with a thick wing; leaves not pellucid-punctate, subacute or obtuse at the apex and without a gland below ..... **Pemphis**
1b Herbs or suffrutices:
5a Partitions of the ovary complete and then placenta continuous with the style; flowers in axillary, ± pedunculate cymes or in contracted umbellate or capitate cymes enveloped by 2 large bracteoles; capsule dehiscing by a small apical operculum, the lower part persisting, subseptifragal or disrupting irregularly ..... **Nesaea**
5b Partitions of the ovary incomplete and then placenta not continuous with the style; flowers axillary and solitary or in ± pedunculate cymes or in glomerules at the expanded base of the leaves; capsule dehiscing by valves or disrupting irregularly:
6a Capsule dehiscing by transversely striate valves (under the microscope); usually aquatic plants ..... **Rotala**
6b Capsule disrupting irregularly with the walls not transversely striate; hygrophilous plants but usually not aquatic:
7a Ovules and seeds many, small; flowers 3–5-merous; anthers yellow; capsule with relatively thick walls ..... **Ammannia**
7b Ovules and seeds 2–5, larger than above; flowers (3)4(5)-merous; anthers violet; capsule with very thin walls ..... **Hionanthera**

Ammannia L.

Fernandes: 174 (1970); Fernandes: 305 (1978a); Fernandes: 36 (1980a); Izidine & Bandeira: 51 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Galpinia N.E.Br.

Fernandes: 279 (1978a); Fernandes: 4 (1980a); Coates Palgrave: 780 (2002).

Monospecific: *Galpinia transvaalica* N.E.Br., Zimbabwe, Mozambique, and sthn Afr.

Hionanthera A.Fern. & Diniz

Fernandes & Diniz: 90 (1955); Fernandes: 309 (1978a); Fernandes: 40 (1980a); Lebrun & Stork: 358 (2003).

Annual or perennial, aquatic or terrestrial, glabrous herbs. **Leaves** decussate, sessile, linear, widened at base, canaliculate above. **Flowers** (3)4(5)-merous, in axillary, sessile, many-flowered dense dichasia surrounded by widened bases of leaves; outer bracteoles 2, ± as long as glomerules, inner ones many, subulate, membranous, whitish. **Calyx** campanulate, scarious, 8-nerved below, 4-nerved above point of origin of stamens, with short appendages in sinuses and a nectariferous ring at bottom. **Petals** persistent, corrugated. **Stamens** (3)4(5), opposite lobes; anthers dorsifixed, they and pollen violet. **Ovary** sessile or shortly stipitate, with partitions interrupted above column of placenta (placenta then not continuous with style) incompletely 2-locular, 2–5-ovulate; style ± long. **Cap-**

sule thinly membranous, dehiscing irregularly. **Seeds** few, concave-convex, relatively large, dark violet.

Species 2, trop. Africa; sthn trop. Afr. 2, Zimbabwe, Mozambique.

Lawsonia L.

Linnaeus: 349 (1753); Fernandes: 277 (1978a); Fernandes: 3 (1980a).

Evergreen, glabrous shrubs or small trees; young branches 4-angular, old ones terete, rigid and often spinescent. **Leaves** decussate, elliptic to oblanceolate, entire. **Flowers** bisexual, 4-merous, in lax leafy terminal panicles. **Calyx** turbinate with tube short; lobes spreading and broadly ovate; appendages absent. **Petals** broadly ovate, cordate at base, very much corrugated in bud, slightly clawed, yellowish. **Stamens** exserted, 4 opposite sepals or often 8 in pairs also opposite sepals or rarely 9–12 ternate; filaments filiform-subulate; anthers broadly oblong. **Ovary** sessile, subglobose, 2–4-locular; style thick, continuous with placentas, persistent, a little longer than stamens; stigma capitate. **Fruit** globose, indehiscent or disrupting irregularly. **Seeds** many, thick, 4-sided; cotyledons flat.

Monospecific genus: *Lawsonia inermis* L., native of western tropical Asia, N Africa and probably of the eastern coast of Africa, widespread by cultivation in tropical regions of the world; powdered leaves (henna) used for staining fingernails etc.; sthn trop. Afr.: Mozambique.

Nesaea Kunth

Fernandes: 178 (1970); Fernandes: 281 (1978a); Fernandes: 7 (1980a); Izidine & Bandeira: 51 (2002); Lebrun & Stork: 358 (2003).

Sthn trop. Afr. 33, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pemphis J.R.Forst. & G.Forst.

Forster & Forster: 67, t. 34 (1776); Fernandes: 281 (1978a); Fernandes: 5 (1980a).

Shrubs or small trees, silky-pilose, with young branches subangular, older ones terete, nodes rather thickened, with conspicuous scars after leaf fall. **Leaves** decussate, oblong-lanceolate, entire. **Flowers** 6-merous, regular, axillary, solitary, rarely geminate, pedicellate; pedicels 2-bracteolate at base, bracteoles very soon caducous. **Calyx** turbinate-campanulate, coriaceous, with lobes widely 3-angular and appendages ± short, horn-shaped. **Petals** 6, obovate, corrugated, shortly clawed. **Stamens** 12–18, 1- or 2-seriately arising a little below middle of calyx tube, subequal or alternately unequal; filaments filiform; anthers broadly elliptic. **Ovary** globose, shortly stipitate, 3-locular; style short or elongate; stigma 2-lobed; ovules many, erect. **Capsule** subglobose, ± enclosed in calyx tube, becoming almost 1-locular, dehiscing by a transverse slit at middle (circumscissile). **Seeds** many, erect, imbricate, obcuneate, winged; wing thickened.

Monotypic or genus with 2 species, one littoral and widespread in Old World tropics, the other confined to the low mountains of SW Madagascar; sthn trop. Afr. 1: *Pemphis acidula* J.R.Forst. & G.Forst., Mozambique.

Rotala L.

Fernandes: 165 (1970); Fernandes: 312 (1978a); Fernandes: 45 (1980a); Lebrun & Stork: 366 (2003).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sonneratia L.f.

Linnaeus filius: 38, 252 (1782 '1781') name conserved; Sangai: 1 (1968); Fernandes: 327 (1978b) under Sonneratiaceae; Fernandes: 1 (1980b) under Sonneratiaceae; Mabberley: 671 (1997); Coates Palgrave: 781 (2002) under Sonneratiaceae; Angiosperm Phylogeny Group: 434 (2003).

Trees or shrubs, evergreen, glabrous, growing in mangroves, with many thick, finger-like pneumatophores; young branches cylindric, swollen at nodes. **Leaves** opposite-decussate, entire, coriaceous, petiolate; stipules 0. **Flowers** bisexual, regular, solitary or in 3s, axillary or terminal. **Calyx** thick and leathery, 4–8-lobed; tube campanulate. **Petals** as many as and shorter than calyx lobes, strap-shaped, inconspicuous, white, resembling filaments, soon deciduous. **Stamens** many, showy, inflexed in bud, arising in several rows on a perigynous ring at mouth of calyx tube; filaments free, white; anthers kidney-shaped, medifixed, opening lengthwise. **Ovary** multilocular, adnate to calyx tube at base; ovules many, anatropous, bitegmic, on a thick axile placenta; style simple, long; stigma subcapitate. **Fruit** a multilocular, many-seeded berry free from calyx tube and eventually stipitate, surrounded at base by persistent calyx. **Seeds** curved, angular, with a thick coriaceous testa; endosperm 0; embryo with short leafy cotyledons.

Species 8, tropical Old World; sthn trop. Afr. 1: *Sonneratia alba* Sm., Mozambique. Sometimes placed in Sonneratiaceae, together with the small Indomalesian genus *Duabanga* Buch.-Ham.

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Maesaceae
(previously under Myrsinaceae)
(Dilleniidae—Primulales)
(Asterids—Ericales)

Dioecious or possibly polygamous trees, shrubs or scramblers, sometimes with runners; pubescence of nonglandular, uniseriate trichomes and lepidote scales. **Leaves** alternate, petioled, simple, mostly shallowly to distinctly serrate, often gland-dotted. **Inflorescences** axillary or terminal racemes or panicles. **Flowers** bi- or unisexual, regular, 4- or 5-merous, small and inconspicuous, entomophilous. **Calyx** persistent, with 2 bracts at base; lobes imbricate, mostly broadly ovate. **Corolla** campanulate, longer than calyx, with a well demarcated tube; lobes broadly ovate to subrotund, spreading, quincuncial-imbricate in bud. **Stamens** arising in mouth of corolla tube; filaments usually long, very rarely short or 0, ± terete; anthers oblong-cordate, often emarginate, dorsifixed at or below the middle, dehiscing by longitudinal slits or aborted. **Ovary** inferior or semi-inferior, 1-locular; ovules usually many, arranged in several rows on the placenta; style short or almost obsolete; stigma often ± distinctly lobed. **Fruit** indehiscent, small, globose, ovoid or subturbinate, dry or fleshy, with a somewhat woody endocarp, crowned with persistent style and calyx, several-seeded. **Seeds** many, small, embedded in placenta, angular, dark brown; testa reticulate; endosperm abundant; embryo oblique to almost transverse.

Genus 1, species ± 200, Old World tropics; sthn trop. Afr.: genus 1, species 2.

Anderberg *et al.*: 183 (2000); Coates Palgrave: 866 (2002); Angiosperm Phylogeny Group: 420 (2003).

Maesa Forssk.

Forsskål: 66 (1775); White: 316 (1962); Taton: 2 (1980); Kupicha: 198 (1983); Halliday: 2 (1984); White *et al.*: 406 (2001); Coates Palgrave: 866 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Malpighiaceae
(Rosidae—Malpighiales)
(Eurosids I—Malpighiales)

Archer, R.H. in Leistner: 346 (2000).

Sthn trop. Afr.: genera 7, species 23.

Exell & Mendonça: 250 (1951); Launert: 109 (1963); Launert & Gonçalves: 1 (1969).

Key to genera

1a Leaves alternate:
- 2a Styles 2, curved inwards; wing surrounding each samara longer than broad ..... **Acridocarpus**
- 2b Styles 3, erect; wing surrounding samara much broader than long ..... **Caucanthus**

1b Leaves opposite or ternate:
- 3a Anthers linear, 3–4 mm long; samara with the lateral wing divided into 5–7 narrow, stellately arranged lobes ..... **Tristellateia**
- 3b Anthers ovate, oblong or ovate-oblong, 1.0–1.8(–2.5) mm long; wing(s) of the samara ± entire:
  - 4a Calyx with 8–10 glands: 4 sepals each with 2 glands, 1 sepal sometimes without glands; fruit of (1–)3 samaroid mericarps, each ± semicircular in outline with the flat dorsal wing ± as wide as the nut ..... **Heteropterys**
  - 4b Calyx without glands, or glands inconspicuous; fruit a samara with lateral and dorsal wings, or if only with a dorsal wing then the samara obliquely ovate with the winged portion much wider than the nut:
    - 5a Samara obliquely ovate in outline with only a dorsal wing longer than broad ..... **Sphedamnocarpus**
    - 5b Samara with 1 or 2 lateral wings or with lateral and dorsal wings:
      - 6a Styles shorter than, or ± as long as, ovary and shorter than to slightly longer than stamens ..... **Caucanthus**
      - 6b Styles always longer than ovary and distinctly longer than stamens:

7a Petals clawed, at least shortly so, usually with fringed or denticulate margins; samara with a circular or ovate membranous lateral wing, and often a shorter dorsal wing; styles with incurving stigmas ..... **Triaspis**

7b Petals not clawed, margins entire; samara with 2 lateral wings which are connate at the base and distinct at the top; styles sometimes slightly curved but stigmas not incurved ..... **Flabellaria**

Acridocarpus Guill. & Perr.

Exell & Mendonça: 253 (1951); Launert: 109 (1963); Launert: 2 (1968); Launert & Gonçalves: 2 (1969); Gonçalves & Launert: 141 (1983–84); Coates Palgrave: 456 (2002); Mapaura & Timberlake: 166 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Malawi, Mozambique, and sthn Afr.

Caucanthus Forssk.

Forsskål: cxi, 91 (1775); Launert: 119 (1963); Launert: 24 (1968); Launert & Gonçalves: 12 (1969).

Woody climbers; younger stems densely covered with short soft white sericeous hairs, older ones very finely pubescent or glabrescent. **Leaves** spirally arranged or opposite, ovate-cordate, pubescent or glabrescent above, grey-tomentose beneath and with 2 large glands near base (usually concealed by indumentum); petiole densely sericeous, usually with 2 small glands above middle; stipules very small, deciduous. **Inflorescences** racemose or corymbose-paniculate, axillary or terminal. **Flowers** regular, bisexual, evil-smelling; bracts ovate; bracteoles lanceolate or linear-subulate. **Sepals** broadly ovate with a narrowed base, sericeous outside; without glands. **Petals** shortly unguiculate, carinate, subhastate at base, glabrous, margins wholly or partially fimbriate. **Stamens** glabrous, with dorsifixed, subversatile, oblong anthers; filaments somewhat fleshy. **Ovary** densely sericeous; styles fairly stout, truncate, shorter than, as long as or slightly exceeding stamens. **Fruit** with lateral wing completely surrounding nut, oblong-elliptic, entire; dorsal wing absent.

Species 3, E and NE Africa to Arabian Peninsula; sthn trop. Afr. 1: *Caucanthus auriculatus* (Radlk.) Niedenzu, Zimbabwe, Malawi, Mozambique.

Flabellaria Cav.

Cavanilles: 436 (1790); Exell & Mendonça: 250 (1951); Launert: 21 (1968).

Woody climbers up to 15 m long. **Leaves** opposite, simple, petiolate, entire; stipules absent. **Flowers** regular, in many-flowered terminal or axillary panicled racemes, white or cream. **Sepals** 5, valvate, closed over petals in bud, eglandular. **Petals** 5, not clawed, entire, glabrous. **Stamens** 10, all bearing anthers; filaments free or somewhat connate at very base; anthers basifixed, elliptic or oblong. **Ovary** 3-locular, densely pilose; styles 3, much longer than stamens. **Fruit** a samara with 2 lateral wings connate at base and distinct at top.

Monotypic genus: *Flabellaria paniculata* Cav., trop. Africa; sthn trop. Afr.: Angola.

Heteropterys Kunth

Kunth: 163 (1822) name conserved; Exell: 50 (1927); Exell & Mendonça: 254 (1951) as *Heteropteris*; Badré: 20 (1972) as *Heteropteris*.

Shrubs or lianes. **Leaves** opposite, simple, petiolate, entire, base of lamina and/or petiole usually glandular; stipules indistinct. **Inflorescences** axillary or terminal, generally paniculate; bracts and bracteoles persistent. **Sepals** 5, each with 2 dorsal glands, or 1 without glands. **Petals** 5, unguiculate, usually entire and glabrous. **Stamens** 10, all fertile, glabrous; filaments fused at base; anthers basifixed. **Ovary** 3-locular; styles free; laterally compressed; stigmas terminal, in lateral, inside position. **Fruit** consisting of (1–)3 samaroid mericarps, each with a dorsal suborbicular wing.

Monotypic genus: *Heteropterys leona* (Cav.) Exell, W Africa; sthn trop. Afr.: Angola.

Sphedamnocarpus Planch. ex Benth. & Hook.f.

Exell & Mendonça: 252 (1951); Launert: 119 (1963); Launert & Gonçalves: 14 (1969).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Triaspis Burch.

Exell & Mendonça: 250 (1951); Launert: 113 (1963); Launert: 14 (1968); Launert & Gonçalves: 7 (1969).

Unibellulanthus S.Moore; Exell: 50 (1927).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tristellateia Thouars

Thouars: 47 (1806); Launert: 113 (1963); Launert: 12 (1968); Launert & Gonçalves: 6 (1969).

Woody climbers, younger stems usually greyish-pubescent, older ones glabrous, densely lenticellate. **Leaves** opposite, ovate or broadly elliptic, entire, with two glands near apex of petiole; stipules very small. **Inflorescence** racemose, terminal; many-flowered; pedicels articulated, 2-bracteolate. **Flowers** regular, bisexual. **Sepals** oblong, sericeous outside, persistent. **Petals** oblong, shortly unguiculate, carinate, entire, bright yellow. **Stamens** with glabrous basifixed anthers; filaments of outer whorl longer and broader at base. **Ovary** globose; only 1 (very seldom 2) styles fully developed, terete. **Fruit** subligneous: lateral wing divided into 6 oblanceolate-linear, usually denticulate lobes, dorsal crest with a spine 8–10 mm long. **Seeds** subglobose, with a short acumen formed by the radicle.

Species 22, mainly in Madagascar, but with 1 species known from SE Asia and 1 from the African continent: *Tristellateia africana* S.Moore; in sthn trop. Afr. only in Mozambique.

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Malvaceae
(in broad sense, including Bombacaceae, Tiliaceae and Sterculiaceae)
(Dilleniidae—Malvales)
(Eurosids II—Malvales)

References in Leistner (2000): Bombacaceae: Bredenkamp, C.L.: 178; Malvaceae: Leistner, O.A. & Bredenkamp, C.L.: 347; Sterculiaceae: Bredenkamp, C.L.: 539; Tiliaceae: Bredenkamp, C.L.: 547.

Herbs, shrubs or trees, sometimes with fibrous, fleshy trunks attaining a very large girth, sometimes monoecious, dioecious or polygamous, usually with stellate hairs. **Leaves** alternate, simple, unlobed to digitately lobed or partite to 3–9-foliolate, petiolate, usually palmately veined, sometimes penniveined; stipules mostly present, free, usually narrow or setaceous, often deciduous. **Flowers** ± regular, bisexual or sometimes unisexual, at least functionally so, usually pedicelled, sometimes showy; arranged in axillary or terminal racemes, panicles, cymes, corymbs or fascicles, or solitary; bracts and bracteoles often present, with or without an epicalyx of 3–many free or connate segments. **Calyx** 3–5-lobed or sepals free, usually valvate. **Petals** (3, 4)5 or 0, free but often adnate to base of staminal tube, sometimes glandular at base inside. **Stamens** 5–many, free or with filaments partly to almost completely fused into a tube around the gynoecium, sometimes raised on an androgynophore; staminodes 0 or present; anthers 1- or 2-thecous, with longitudinal slits or apical pores; pollen spinulose or smooth. **Ovary** superior, of 1–many free to fused carpels with 1–many ovules in each carpel/locule, usually on axile placentas; style mostly simple with stigma from ± entire to variously branched, or with as many styles as carpels. **Fruit** a loculicidal capsule or schizocarp, or indehiscent, or a ± fleshy drupe. **Seeds** 1–many, glabrous or hairy; embryo straight or curved; endosperm copious to 0.

Sthn trop. Afr.: genera 45, species ± 359.

Key to genera

1a Petals absent; flowers unisexual due to abortion, sometimes bisexual (STERCULIOIDEAE):
  2a Carpels more than 15 in several rows; calyx 6–8-lobed ..... **Octolobus**
  2b Carpels 3–15, in 1 row; calyx 3–6-lobed:
    3a Fruiting carpels winged or inflated, submembranous; calyx tube long ..... **Hildegardia**
    3b Fruiting carpels neither winged nor inflated and membranous, usually ± woody and fibrous; calyx campanulate:
      4a Fruiting carpel 1-seeded, keeled on the back ..... **Heritiera**
      4b Fruiting carpel several- to many-seeded, not markedly keeled on the back:
        5a Anthers irregularly arranged in a globose head at the apex of the androphore ..... **Sterculia**
        5b Anthers arranged in 1 or 2 whorls at the apex of the androphore:
          6a Seeds with a large unilateral wing; endosperm present ..... **Pterygota**
          6b Seeds not winged, without endosperm ..... **Cola**
1b Petals present, sometimes small; flowers bisexual or sometimes unisexual (usually by abortion):
  7a Leaves digitately 3–9-foliolate; trees with fruit a large woody ± ovoid capsule or indehiscent, 60–250 mm long; seeds embedded in a powdery matrix or in copious woolly hairs (BOMBACOIDEAE):
    8a Stamens 5–15, in 5 bundles of 1–3 each; flowers ± 30 mm long, usually in fascicles; fruit dehiscent, filled with silky hairs ..... **Ceiba**
    8b Stamens many, indefinite; flowers ± 50–150 mm long, solitary; fruit dehiscent or indehiscent, filled either with hairs or floury pulp:
      9a Calyx deeply 5-lobed; fruit indehiscent, filled with seeds embedded in floury, acid pulp and fibres ..... **Adansonia**
      9b Calyx truncate or with short rounded lobes; fruit dehiscent, filled with seeds and copious silky hair ..... **Bombax**
  7b Leaves simple, entire to 3–9-lobed, rarely 5–7-digitate, but then herbaceous plants (*Triumfetta grandistipulata* and *T. digitata*); fruit various but smaller than above; seeds not embedded in powdery matrix or in wool:
    10a Flowers functionally unisexual; ovary with 1(2) ovules per carpel (BROWNLOWIOIDEAE):
      11a Ovary of (1)2–5(6) free carpels; fruit of follicles with 1 large seed ..... **Christiana**
      11b Ovary 2-locular, with a large, spreading, 2-lobed, ± sessile stigma; fruit a 2-valved capsule, each valve prolonged by 2 horizontally spreading foliaceous wings ..... **Berrya**
    10b Flowers usually bisexual; ovules mostly more than 1 per locule:
      12a Stamen filaments fused into a tube or a funnel-shaped structure surrounding the style; stamens indeterminate, staminal tube ending in 5 small teeth, or truncate, or split at the apex into many filaments (MALVOIDEAE):

13a Stamens many, indefinite:
14a Style branches and stigmas twice as many as carpels (style branches mostly 10, carpels 5 (tribe **Malvavisceae**):
15a Epicalyx of (3–)5–16 filiform to broadly ovate, mostly free segments; carpels without hooked spines ..... **Pavonia**
15b Epicalyx of 5 lobes fused in lower third; carpels with hooked spines ..... ***Urena**
14b Style branches and stigmas as many as carpels (5–many) or style and stigma ± entire:
16a Fruit a capsule or indehiscent and woody to ± fleshy; staminal tube toothed at apex to truncate, bearing anthers on most or much of its surface (tribe **Hibisceae**):
17a Style simple (rarely very slightly divided at the tip), apex 5-lobed or clavate with ± coherent stigmas:
18a Calyx spathaceous, thin, splitting laterally and deciduous with the corolla ..... **Abelmoschus**
18b Calyx not splitting laterally, truncate or regularly lobed, persistent:
19a Calyx distinctly 5-lobed, with rows of black oil glands along the nerves ..... **Cienfugosia**
19b Calyx truncate, entire or at most dentate or undulate:
20a Epicalyx of 3 large, leaf-like, persistent bracts ..... **Gossypium**
20b Epicalyx of 3–8 small, narrow, deciduous bracts:
21a Fruit indehiscent, woody or somewhat fleshy ..... **Thespesia**
21b Fruit a loculicidally dehiscent capsule ..... **Azanza**
17b Style divided apically into distinct branches; stigmas capitate to club-shaped:
22a Style 3(4)-branched; epicalyx of 3 large, leaf-like, persistent bracts ..... **Gossypioides**
22b Style 5-branched; epicalyx of 5–20 variable bracts, occasionally absent:
23a Ovules and seeds solitary in each locule ..... **Kosteletzkya**
23b Ovules and (mostly) seeds 2 or more in each locule ..... **Hibiscus**
16b Fruit a schizocarp with mericarps eventually separating from a persistent axis; staminal tube split at apex into many filaments (tribe **Malveae**):
24a Epicalyx absent:
25a Ovule 1 per locule; seeds 1 per mericarp, lateral walls of mericarps not disintegrating before fruit breaks up ..... **Sida**
25b Ovules 2 or more per locule; seeds mostly 2 or more per mericarp, or sometimes 1 by abortion:
26a Mericarps 5–40, not divided ..... **Abutilon**
26b Mericarps 3–5, ± divided into 2 compartments by a transverse constriction ..... **Wissadula**
24b Epicalyx present:
27a Stigmas ± apical, usually with distinctly greater diameter than the rest of the style branches ..... ***Malvastrum**
27b Stigmas decurrent on adaxial side of the filiform to narrowly clavate style branches ..... ***Malva**
13b Stamens 5, or in 5 small dense sessile clusters of 3 anthers each (**Byttnerioideae**):
28a Petals hooded over the stamens; staminodes present:
29a Petals with a long apical appendage; stamens 5; fruits spiny ..... **Byttneria**
29b Petals without a long apical appendage; stamens in 5 clusters of 3 anthers each ..... **Scaphopetalum**
28b Petals not hooded; staminodes absent or inconspicuous:
30a Ovary 5-locular; capsule loculicidally 5-valved ..... **Melochia**
30b Ovary 1-locular; capsule 2-valved, 1-seeded ..... **Waltheria**
12b Stamen filaments free or fused only partly:
31a Stamens 5:
32a Staminodes present; flowers with 3 persistent epicalyx bracts ..... **Melhania** (**Dombeyoideae**)
32b* Staminodes absent; epicalyse absent
33a Styles 5; stamens opposite the petals, not raised on an androgynophore ..... **Hermannia**
33b Style 1; stamens raised on a short androgynophore ..... **Triumfetta** (**Grewioideae**)
31b Stamens more than 5, mostly indeterminate, sometimes in fascicles of 3 or 4:
34a Fruit of 5 samara-like 1-seeded carpels ..... **Triplochiton** (**Helicteroideae**)
34b Fruit various, not as above:
35a Petals much shorter than sepals, pilose towards margins; seeds conspicuously arillate ..... **Leptonychia** (**Byttnerioideae**)
35b Petals ± as long as or longer than the sepals; seeds without or with arillus:
36a Staminodes 5; stamens 10–15, either basally fused into a short tube incorporating the staminodes, or in pairs opposite the petals with the staminodes alternating with the stamen pairs (**Dombeyoideae**):
37a Staminal tube short, bearing staminodes and stamens; petals persistent, often becoming dry or scarious ..... **Dombeya**
37b Staminal tube absent; stamens arranged in pairs opposite sepals; petals soon deciduous ..... **Nesogordonia**
36b Staminodes absent or, if present, usually more than 5 and irregularly arranged; stamens usually many:
38a Fruits drupaceous, never dehiscent, with ± fleshy mesocarp, never with stiff or soft bristles:
39a Ovary 2–4-locular; fruit a 1–4-lobed drupe or berry with 1–4 pyrenes ..... **Grewia** (**Grewioideae**)
39b Ovary 5–10-locular:
40a Sepals 4; petals 4, without glandular area at the base; stipules and bracts entire ..... **Duboscia**
40b Sepals 5; petals 5, with a glandular area at the base; stipules and involucral bracts palmatifid ..... **Desplatsia**
38b Fruits dry, often capsular and breaking up irregularly, often armed with stiff or soft bristles:
41a Fruits with stiff or soft bristles:

42a Seeds 1 or 2 per locule; petals glandular at base on inside; a short androgynophore is present; fruit prickly or spiny ..... **Triumfetta**

42b Seeds many, if only 2 then fruit smooth, not spiny; petals not glandular at the base; androgynophore absent or very short; fruit prickly or smooth:

43a Annual herbs with axillary capsules ± 8 mm in diameter with spines ± 3 mm long ..... **Corchorus**

43b Perennial herbs, shrubs or small trees; capsules larger with longer bristles:

44a Stamens all fertile, in 4 fascicles opposite the petals; leaves not lobed; petals shorter than sepals; capsule 3-valved ..... **Ancistrocarpus**

44b Outer stamens sterile; stamens not grouped in fascicles; leaves often lobed; petals ± as long as sepals; capsule 4–8-valved:

45a Inflorescence umbellate; ovary ovoid; capsule ellipsoid or subglobose; flowers mostly white or pink .... **Sparrmannia**

45b Inflorescence paniculate; ovary oblong; capsule oblong; flowers pink to red ..... **Clappertonia**

41b Fruits without bristles:

46a Herbs or subshrubs; anthers all fertile, with free filaments, sometimes on a short androgynophore; fruit a 2–5-locular loeulicidal capsule ..... **Corchorus**

46b Trees or shrubs; staminodes present or absent; anther filaments basally fused; androgynophore always absent; fruit a capsule or indehiscent:

47a Fruits spindle-shaped, strongly longitudinally ribbed, ± indehiscent; seeds discoid, without aril, contained in pits in endocarp; ovary 6–10-locular; stamens many, all fertile; anthers dehiscing by apical pores .... **Glyphaea**

47b Fruits globose, linear-cylindric or spindle-shaped, not or only slightly longitudinally ribbed; stamens all fertile with free filaments; androgynophore sometimes present; herbs or subshrubs ..... **Corchorus**

Abelmoschus Medik.

(Malvoideae)

Exell: 423 (1961); Exell & Gonçalves: 8 (1979); Lebrun & Stork: 710 (2003).

Hibiscus L. in part; Exell & Mendonça: 178 (1937/1951).

Species 15, Old World tropics; sthn trop. Afr. 2: *Abelmoschus ficulneus* (L.) Wight & Arn. often confused with **A. esculentus* (L.) Moench which is cultivated and may appear as an escape in Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Abutilon Mill.

(Malvoideae)

Exell & Mendonça: 151, 373 (1937/1951); Baker: 17 (1939); Meeuse: 484 (1961); Meeuse & Gonçalves: 89 (1979); White *et al.*: 353 (2001); Coates Palgrave: 701 (2002); Lebrun & Stork: 710 (2003).

Sthn trop. Afr. 19, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Adansonia L.

(Bombacoideae)

Exell & Mendonça: 143 (1937/1951); Wild: 512 (1961); Wild & Gonçalves: 2 (1979a); Beentje: 1 (1989); Baum & Oginuma: 11 (1994); Coates Palgrave: 705 (2002); Walker: 49 (2002).

Sthn trop. Afr. 1: *Adansonia digitata* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ancistrocarpus Oliv.

(Grewioideae)

Oliver: 173 (1865) conserved name; Masters: 265 (1868b); Exell & Mendonça: 237 (1937/1951); Wilczek: 72 (1963).

Shrubs or small trees. **Leaves** 3- or 5-nerved at base, oblanceolate to obovate or elliptic, acuminate, denticulate, stellate-tomentose, especially along nerves; stipules lanceolate-linear, caducous. **Inflorescences**: lateral or terminal umbellate cymes. **Flowers** bisexual, regular. **Sepals** 4, free, ± apiculate. **Petals** 4, shorter than sepals, without glands at base, glabrous. **Stamens** many, all fertile, arranged in 4 groups opposite petals and fused at base; anthers oblong-linear, basifixed, dehiscing longitudinally. **Ovary** ± 6-celled; ovules many, ± parietal, anatropous; style filiform; stigma obtuse. **Fruit** capsular, 3-valvate, dehiscent, globular to ellipsoid, coriaceous, densely covered with prickles ± half as long as fruit body. **Seeds** many, with endosperm.

Species 4, trop. Africa; sthn trop. Afr. 1: *Ancistrocarpus densispinosus* Oliv., Angola (Cabinda).

Azanza Alef.

(Malvoideae)

Exell: 432 (1961); Exell & Gonçalves: 19 (1979); Coates Palgrave: 705 (2002).

Sthn trop. Afr. 1: *Azanza garckeana* (F.Hoffm.) Exell & Hillc., ?Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Berrya Roxb.

(Brownlowioideae)

Roxburgh: 60 (1820), conserved name; Kostermans: 423 (1969); Lebrun & Stork: 630 (2003).

Carpodiptera Griseb. (see note below); Wild: 33 (1963); Wild & Gonçalves: 2 (1969); Verdcourt: 5 (2001); Coates Palgrave: 682 (2002).

Small trees; dioecious or more rarely monoecious; branchlets sparsely stellately hairy, soon glabrous. **Leaves** simple, oblong or ovate, with margins entire or repand, petiolate; stipulate. **Inflorescence** of axillary pedunculate cymes. **Flowers** unisexual; pedicels stellate-pubescent; bracts stellate-pilose, caducous. **Calyx** campanulate, 2- or 3-lobed. **Petals** 5, narrowed to base, white, glandless. **Androgynophore** obsolete. Stamens many, united at base. **Ovary** 2-locular, 2-lobed, sessile, with 1(2) pendulous ovules per locule; style obsolete or very short; stigma large and spreading, 2-lobed. **Fruit** a 2-valved capsule, usually

with 1 seed; each valve prolonged by 2 unequal, horizontally spreading, foliaceous wings in a vertical plane. **Seed** large, villous or hairy, at least at apex; testa coriaceous; endosperm fleshy.

Species ?8, ?6 in tropical America, 2 in trop. Africa; sthn trop. Afr. 1: *Berrya africana* (Mast.) Kosterm., Mozambique. Verdcourt (2001: 5) notes: "Kostermans (1969) sank *Carpodiptera* into *Berrya*, and this may prove to be correct but…I am not altogether convinced. A more exhaustive study is needed".

Bombax L.

(Bombacoideae)

Linnaeus: 511 (1753); Linnaeus: 227 (1754); Hiern: 80 (1896); Robyns: 84 (1963); Exell & Mendonça: 144, 372, (1937/1951); Wild: 513 (1961); Beentje: 4 (1989); White *et al.*: 173 (2001); Coates Palgrave: 707 (2002); Lebrun & Stork: 710 (2003); Phiri (Unpublished).

Rhodognaphalon (Ulbr.) Roberty emend. A.Robyns: Wild & Gonçalves: 4 (1979a); Izidine & Bandeira: 49 (2002).

Trees. **Leaves** digitately (3)5–7(–9)-foliolate; leaflets entire, central one larger than outer ones. **Flowers** moderately large, solitary or cymose in leaf axils; pedicels with 3 soon deciduous bracteoles. **Calyx** closed in bud, truncate or subtruncate. **Petals** 5, tomentellose outside. **Stamens** many, united in a tube below, adnate to petals at base, either in 2 whorls with outer whorl of 5 epipetalous bundles and the inner whorl of 5 alternipetalous pairs, or in 5 epipetalous bundles; anthers oblong or reniform. **Ovary** 5-locular; ovules many; stigma 4- or 5-lobed or entire. **Fruit** a loculicidally dehiscent 5-valved woody capsule with a persistent axis. **Seeds** many, irregularly globose or angular, covered in woolly endocarp indumentum; endosperm absent; cotyledons plicate.

Species ± 20. Old World tropics; sthn trop. Afr. 5: 4 occur naturally in Angola, Malawi and Mozambique, and 1: **Bombax oleagineum* (Decne.) A.Robyns is widely cultivated, and may occur as an escape.

Byttneria Loefl.

(Byttnerioideae)

Loefling: 313 (1758), name conserved; Masters: 239 (1868a) as *Buettneria*; Hiern: 92 (1896); Exell: 42 (1927) as *Buettneria*; Exell & Mendonça: 197 (1937/1951); Germain: 301 (1961); Hallé: 148 (1961); Cristobal: 1 (1976).

Climbing shrubs or lianes; young branches puberulous. **Leaves** alternate, simple, petiolate, cordate-ovate, acute, denticulate, palmately 5–7-nerved; petioles shorter than blades; stipules subulate, soon caducous. **Inflorescences** slender, leaf-opposed cymes, sometimes with additional smaller subaxillary cymes; bracteoles linear, small. **Flowers** small, pedicellate; buds conical. **Sepals** 5, lanceolate, finely tomentellose. **Petals** 5, cucullate and adhering to each other at level of anthers, with a long narrow basal claw and a long, subapical linear appendage. **Staminal tube** widening towards mouth; anthers 5, subglobose, subsessile, arising at top of tube, 2-thecous, alternating with 5 very short staminodes. **Ovary** 5-locular, sessile or subsessile, muricate-hispid when young, becoming long-hispid; ovules 2 per locule; style short; stigma 5-lobed. **Capsule** globose, septicidally dehiscent into 5 1-seeded mericarps with long-spiny backs. **Seeds** ovoid, smooth, brownish red, sometimes maculate.

Species 130, pantropical; sthn trop. Afr. 1: *Byttneria catalpifolia* Jacq. subsp. *africana* (Mast.) Exell & Mendonça, Angola.

Ceiba Mill.

(Bombacoideae)

Miller: [287] (1754); Exell & Mendonça: 145, 372 (1937/1951); Wild: 516 (1961); Wild & Gonçalves: 10 (1979a); Beentje: 7 (1989).

Tall trees, with horizontally branched crown and a very straight trunk; bark pale grey, smooth, usually with scattered conical spines. **Leaves** digitately 5–9(usually 7 or very rarely more than 9)-foliolate; lamina of leaflets entire, articulated to a ± suborbicular disc at apex of a long, glabrous petiole. **Flowers** moderately large, axillary or subterminal, solitary in axils or often 1–3-fasciculate. **Calyx** cupular, 5-lobed. **Petals** 5, imbricate, rose-coloured or white. **Stamens** (10)15, united in 5 phalanges, each bearing 2 or 3 coiled anther-thecae and united below in a tube. **Ovary** 5-locular, each locule with many ovules; stigma club-shaped, pentagonal. **Capsule** a woody or coriaceous 5-valved capsule. **Seeds** many, surrounded by endocarp wool; endosperm thin or absent; cotyledons much contorted.

Species 10: 9 confined to tropical and subtropical America; *Ceiba pentandra* (L.) Gaertn., the Silk Cotton or Kapok Tree, is native in tropical America and probably in trop. Africa. Most specimens in sthn trop. Afr. are cultivated but the species has been recorded as spontaneous at times in various parts of trop. Africa, including Angola, Zambia, Malawi and Mozambique.

Christiana DC.

(Brownlowioideae)

Candolle: 516 (1824); Masters: 241 (1868b); Exell & Mendonça: 209 (1937/1951); Wilczek: 3 (1963); Kubitzki: 537 (1995); Verdcourt: 2 (2001).

Small to tall trees, often dioecious by abortion; young parts, including outside of calyx and carpels, with dense, yellowish stellate hairs. **Leaves** palmatinerved, ovate, acuminate with cordate base; stipules linear. **Inflorescences** terminal and axillary corymbiform cymes. **Flowers** usually unisexual by abortion. **Calyx** campanulate, irregularly 3–5-fid. **Petals** 5(6 or 7). **Stamens** many, all fertile in male flowers, sterile in female flowers, free, not arising on a raised torus; filaments filiform; anthers subglobose. **Ovary** of (1)2–5(6), free, 1-locular, 2-valved carpels; ovules 1 per carpel, ascending. **Fruit** apocarpous into follicles opening by 2 valves; endocarp light brown, shiny, crustaceous. **Seeds** 1 per follicle, large, variegated, at first with hairs along raphe.

Species 2, S America and trop. Africa; sthn trop. Afr. 1: *Christiana africana* DC., Angola.

Cienfuegosia Cav.

(Malvoideae)

Exell: 36 (1927) as *Cienfuegosia*; Exell & Mendonça: 180 (1937/1951); Exell: 426 (1961); Exell & Gonçalves: 11 (1979).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Clappertonia Meisn.

(Grewioideae)

Meisner: 36 (1837); Exell & Mendonça: 238 (1937/1951); Wild: 80 (1963); Wild & Gonçalves: 54 (1969); Nyananyo: 267 (1988); Verdcourt: 97 (2001).

Houckenya Willd.; Exell: 47 (1927).

Small shrubs with stems and petioles covered with dense rufous-stellate hairs. **Leaves** broadly ovate to oblong, 3–7-lobed, margins coarsely serrrate; stipules linear-subulate to lanceolate. **Inflorescences** of small terminal or axillary cymes. **Sepals** 4 or 5, oblong, with an apical or subapical gland. **Petals** 4 or 5, clawed, glandless, pink, purplish or white. **Stamens** many, up to ± 12 fertile and slightly longer than the rest; staminodes filamentous or lanceolate-linear and sterile, without anther thecae. **Ovary** sessile, 4–8-locular, with many ovules in each locule; stigma lobed or denticulate at apex. **Capsule** ellipsoid or oblong-ovoid, loculicidally 4–8-valved; valves transversely septate within, with many stiff pilose bristles outside. **Seeds** many, discoid or compressed-obovoid.

Species 2, trop. Africa; sthn trop. Afr. 1: *Clappertonia ficifolia* (Willd.) Decne., Angola, Zambia, Mozambique.

Cola Schott & Endl.

(Sterculioideae)

Exell & Mendonça: 203 (1937/1951); Burtt Davy *et al.*: 96 (1958); Wild: 558 (1961); Wild & Gonçalves: 47 (1979b); Dowsett-Lemaire & White: 83 (1990); White *et al.*: 556 (2001); Coates Palgrave: 717 (2002); Izidine & Bandeira: 52 (2002); Lebrun & Stork: 668 (2003).

Edwardia Raf.; Hiern: 84 (1896).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Corchorus L.

(Grewioideae)

Exell & Mendonça: 239 (1937/1951); Wild: 82 (1963); Wild & Gonçalves: 55 (1969); Edmonds: 1 (1990); Andrews: 101 (2001).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Desplatsia Bocq.

(Grewioideae)

Bocquillon: 51 (1866); Masters: 266 (1868b) (as *Desplatzia*); Exell & Mendonça: 225 (1937/1951); Wilczek: 40 (1963).

Small trees or shrubs. **Leaves** ovate-oblong to obovate-oblong, cordate to subcordate and asymmetric at base, long-acuminate, obscurely dentate; domatia often present; stipules palmatifid, ± persistent. **Inflorescences** many-flowered, axillary or terminal umbellate cymes; involucral bracts 3- or 4-fid, not enveloping buds. **Flowers** bisexual. **Sepals** 5, oblong, hooded. **Petals** 5, shorter than sepals, with a glandular area at base inside. **Stamens** many, fused at base into a glabrous or pubescent tube ciliate at top; anthers subglobose, dorsifixed, dehiscing longitudinally. **Ovary** 5–10-locular, tomentose; style cylindric, glabrous; stigma ± fringed; ovules many, in 2 rows in each locule, anatropous. **Fruit** drupaceous, indehiscent, externally coriaceous, inside fibrous. **Seeds** many, oblong, narrowly winged, embedded in fibrous tissue.

Species 7, tropical W Africa; sthn trop. Afr. 1: *Desplatsia subericarpa* Bocq., Angola (Cabinda).

Dombeya Cav.

(Dombeyoideae)

Exell & Mendonça: 185 (1937/1951); Wild: 518 (1961); Wild & Gonçalves: 2 (1979b); Seyani: 1 (1991a); Seyani: 1253 (1991b); White *et al.*: 559 (2001); Coates Palgrave: 708 (2002); Izidine & Bandeira: 52 (2002).

Assonia Cav.; Hiern: 85 (1896).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Duboscia Bocq.

(Grewioideae)

Bocquillon: 50 (1866); Masters: 265 (1868b); Exell & Mendonça: 209 (1937/1951); Wilczek: 38 (1963).

Trees. **Leaves** obovate-oblong to lanceolate, rounded to ± cordate and 3-nerved at base, acuminate, denticulate; stipules entire, ± caducous. **Inflorescences** axillary cymes; bracts entire. **Flowers** bisexual, regular, involucrate; with a short glabrous androgynophore. **Sepals** 4, valvate, oblong. **Petals** 4, subulate, with a glandular area at base inside. **Stamens** many, all free and fertile, arising on a thick, fleshy villose disc; anthers subglobose, dorsifixed, dehiscing longitudinally. **Ovary** 5–10-locular; style shorter than ovary; stigma fimbriate; ovules many, in 2 rows in every locule, anatropous. **Fruit** drupaceous, indehiscent, fibrous inside. **Seeds** many, flattened, embedded in fibrous tissue.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda).

Glyphaea Hook.f.

(Grewioideae)

Hooker: t. 760 (1848); Exell & Mendonça: 237 (1937/1951); Wild: 35 (1963); Wild & Gonçalves: 4 (1969); Verdcourt: 99 (2001); White *et al.*: 570 (2001); Coates Palgrave: 683 (2002).

Small trees; young parts stellately tomentellous. **Leaves** oblong or obovate-oblong, irregularly crenate-dentate, strongly 3-nerved and sometimes asymmetrical at base, stellate-pubescent on both surfaces; petiole slightly widened just below leaf lamina; stipules caducous, very small, subulate. **Inflorescence** of leaf-opposed or extra-axillary, 1–several-flowered cymes; bracts very small, caducous. **Sepals** 5, linear-oblong, stellately hairy outside. **Petals** 5, bright yellow, glandless, linear-oblong. **Androgynophore** obsolete. **Stamens** many, all fertile; anther thecae linear, adnate throughout their length, dehiscing by terminal pores and with connective prolonged into a small crest. **Ovary** sessile, 6–10-locular; locules many-ovuled; style simple; stigma simple, not wider than style. **Fruit** oblong-cylindric or fusiform, sulcate, indehiscent, with hard fibrous walls; endocarp with pits containing seeds. **Seeds** discoid, with a fleshy endosperm; cotyledons cordate and roundish.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola, Malawi, Mozambique.

Gossypioides Skovst. ex J.B.Hutch.

(Malvoideae)

Exell: 432 (1961); Exell & Gonçalves: 17 (1979).

Sthn trop. Afr. 1: *Gossypioides kirkii* (Mast.) Skovst. ex J.B.Hutch., Mozambique, and sthn Afr.

Gossypium L.

(Malvoideae)

Exell & Mendonça: 181 (1937/1951); Exell: 428 (1961); Exell & Gonçalves: 14 (1979); Lebrun & Stork: 718 (2003).

Sthn trop. Afr. 3, Angola, Zimbabwe, Mozambique, and sthn Afr.

Grewia L.

(Grewioideae)

Exell & Mendonça: 210 (1937/1951); White: 234 (1962); Wild: 37 (1963); Wild & Gonçalves: 5 (1969); Dowsett-Lemaire & White: 85 (1990); White *et al.*: 570 (2001); Whitehouse: 7 (2001); Coates Palgrave: 684 (2002).

Microcos L.; Exell: 43 (1927). *Vincentia* Bojer; Exell: 43 (1927).

Sthn trop. Afr. ± 60, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Heritiera Aiton

(Sterculioideae)

Aiton: 546 (1789); Kostermans: 466 (1959); Wild: 564 (1961); Wild & Gonçalves: 55 (1979b); Coates Palgrave: 719 (2002).

Evergreen, dioecious trees; branchlets lepidote, but soon glabrescent. **Leaves** simple, very coriaceous, elliptic to ovate, or elliptic-oblong, margin entire or undulate; stipules present. **Flowers** unisexual, in axillary, many-flowered panicles; bracts and bracteoles present. **Calyx** campanulate, 5-lobed. **Petals** absent. **Male flowers**: androphore with 5 anthers at its apex and with a vestigial style protruding through it. **Female flowers**: perianth as in male; ovary of 5 connate carpels; styles connate, short; stigmas 5, thick. **Fruiting carpels** woody, indehiscent, keeled along back, 1-seeded. **Seed** without endosperm; cotyledons very thick.

Species 30, trop. Africa, Indomalesia to Australia and New Caledonia; sthn trop. Afr. 1: *Heritiera littoralis* Aiton, coastal Mozambique.

Hermannia L.

(Byttnerioideae)

Exell & Mendonça: 193 (1937/1951); Wild: 537 (1961); Wild & Gonçalves: 26 (1979b).

Sthn trop. Afr. 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hibiscus L.

(Malvoideae)

Exell & Mendonça: 158, 374 (1937/1951); Baker: 18 (1939); Exell: 434 (1961); Exell & Gonçalves: 22 (1979); Wilson: 47 (1999); Coates Palgrave: 702 (2002); Izidine & Bandeira: 51 (2002); Lebrun & Stork: 719 (2003).

Sthn trop. Afr. ± 78, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hildegardia Schott & Endl.

(Sterculioideae)

Schott & Endlicher: 33 (1832); Wild: 562 (1961); Wild & Gonçalves: 53 (1979b).

Shrubs or sometimes trees, glabrous in all parts except corolla and seeds; bark greyish. **Leaves** very broadly cordate-ovate, obtuse at apex, margin undulate or entire, 7-nerved from base, petiolate. **Flowers** unisexual, salmon-coloured, in axillary racemes appearing before leaves. **Calyx** elongate-campanulate or fusiform-clavate, with short lobes. **Petals** absent. **Anthers** ± 10, linear, in 2 rows in a globose head borne on a slender androphore. **Ovary** of 5 coherent carpels; ovules 1 or 2 per carpel; gynophore present; styles coherent, sometimes very short; stigma lobes 5, reflexed. **Fruiting carpels** stipitate, membranaceous, sometimes winged. **Seeds** 1 or 2, pubescent.

Species 8, mostly Old World tropics; sthn trop. Afr. 1: *Hildegardia migeodii* (Exell) Kosterm., Mozambique.

Kosteletzkya C.Presl

(Malvoideae)

Exell & Mendonça: 157 (1937/1951); Exell: 472 (1961); Lebrun & Stork: 742 (2003).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Leptonychia Turcz.

(Byttnerioideae)

Turczaninow: 222 (1858); Masters: 238 (1868a); Exell & Mendonça: 197 (1937/1951); Hallé: 129 (1961); Germain: 226 (1963); Dowsett-Lemaire & White: 84 (1990); White *et al.*: 562 (2001); Lebrun & Stork: 690 (2003).

Evergreen shrubs or trees. **Leaves** alternate, simple, entire, petiolate, oblong, acuminate, base rounded; small axillary domatia often present on lower surface. **Inflorescences** axillary or on old wood, cymose; bracts present; pedicels articulate. **Flowers** bisexual; buds oblong, sometimes constricted in the middle, acute. **Sepals** 5, ± free, oblong, acute, usually puberulous with stellate hairs on outer surface. **Petals** 5, very short, concave, somewhat fleshy, ciliate, cohering at margins. **Stamens** ± 25, in 5 fascicles opposite petals; filaments basally fused into a short collar; 1–5 staminodes present in each fascicle; anthers with 2 opposite thecae, oblong, dehiscing laterally. **Ovary** 3–5-locular with 5–10 ovules per locule in 2 vertical rows on a central placenta; style central, cylindric; stigma minute, 3(5)-toothed. **Fruit** a subglobose, 3- to 5-locular, loculicidally dehiscent capsule opening with rugose and stellately tomentose valves. **Seeds** 1 in each locule, large; testa black, covered by a red spongy aril; endosperm horny; embryo straight, cotyledons foliaceous.

Species 30, Old World tropics, mainly Africa; sthn trop. Afr. 6, Angola, Malawi.

***Malva** L.

(Malvoideae)

Exell & Mendonça: 146 (1937/1951); Meeuse: 501 (1961).

Sthn trop. Afr. 4, Angola, Zimbabwe, and sthn Afr.; cosmopolitan weeds, some cultivated ornamentals.

***Malvastrum** A.Gray

(Malvoideae)

Meeuse: 503 (1961); Meeuse & Gonçalves: 110 (1979); Phiri (Unpublished).

Sthn trop. Afr. 1: **Malvastrum coromandelianum* (L.) Garcke, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Melhania Forssk.

(Dombeyoideae)

Exell & Mendonça: 189 (1937/1951); Wild: 528 (1961); Wild & Gonçalves: 14 (1979b); Lebrun & Stork: 694 (2003).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Melochia L.

(Byttnerioideae)

Exell & Mendonça: 191 (1937/1951); Wild: 535 (1961); Goldberg: 191 (1967); Exell: 145 (1970); Wild & Gonçalves: 21 (1979b).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Nesogordonia Baill.

(Dombeyoideae)

Baillon: 555 (1886); Wild: 551 (1961); Wild & Gonçalves: 36 (1979b); Barnett & Dorr: 985 (2000).

Cistanthera K.Schum.; Exell & Mendonça: 210 (1937/1951).

Small or large trees, ± stellate-pubescent, at least on young parts. **Leaves** petiolate, simple, oblong to oblong-lanceolate or narrowly ovate; stipules caducous, small. **Flowers** bisexual, solitary or axillary, in pedunculate, few-flowered cymes; pedicels articulated. **Sepals** 5, valvate. **Petals** 5, often somewhat twisted. **Stamens** in an uninterrupted ring or in fascicles of 2–4 opposite sepals; filaments free or ± united within fascicles; and with an inner ring of 5 free fertile stamens or 5 free staminodes opposite petals. **Ovary** obconic or subglobose, pubescent or tomentose, 5-locular; locules 2-ovulate; styles 5, free or united into a single style; stigmas fleshy, papillose. **Capsule** obconic, truncate and excavated at apex, with 5 rather thick wings, dehiscent into 5 valves, with 1 or 2 seeds per locule. **Seeds** with a unilateral wing.

Species 18, trop. Africa and Madagascar; sthn trop. Afr. ?3: *Nesogordonia holtzii* (Engl.) Capuron ex L.C.Barnett & Dorr [= *N. parvifolia* (M.B.Moss ex Milne-Redh.) Capuron ex Wild], Mozambique, and 1 or 2 species in Angola (Cabinda) [Lebrun & Stork: 700 (2003)].

Octolobus Welw.

(Sterculioideae)

Welwitsch: 17 (1869); Hiern: 84 (1896); Exell & Mendonça: 198 (1937/1951); Hutchinson: 394 (1937); Burtt Davy *et al.*: 97 (1958); Hallé: 105 (1961); Cheek & Frimodt-Møller: 682 (1998); Lebrun & Stork: 700 (2003).

Small monoecious trees with straight trunk and pubescent young branches. **Leaves** alternate, mainly towards ends of branches, unifoliolate, entire, petiolate, ± elliptic, acuminate; stipules long-acicular. **Flowers** unisexual, fairly large, subsessile, solitary or sometimes in few-flowered fascicles on old wood; many short, scarious, broadly ovate, imbricate bracts forming a pseudoinvolucre; buds globose or obovoid. **Calyx** campanulate, stellate-pubescent outside, papillate inside, divided ± halfway into 6–8 coriaceous lobes with membranous, induplicate, corrugate margins. **Petals** absent. **Male flowers** with a sturdy androphore bearing a cupuliform crown of many anther thecae in a single row. **Female flowers** with 40–80 almost free, densely stellate-canescent, obliquely elongate-ovoid carpels arranged imbricately and tightly in 2–4 rows to form a globose head with a single row of staminodia at base and raised on a short gynophore; carpels unilocular with many horizontally orientated ovules arranged in 2 rows; stigma obliquely sessile at apex of carpel, swollen, dark purple, papillate. **Fruit** consisting of 8 to many, free, obovoid to clavate, stipitate, tardily dehiscent, few-seeded follicles. **Seeds** subglobose, smooth, black.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola.

Pavonia Cav.

(Malvoideae)

Exell & Mendonça: 155, 374 (1937/1951); Meeuse: 504 (1961); Meeuse & Gonçalves: 114 (1979); White *et al.*: 355 (2001).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pterygota Schott & Endl.

(Sterculioideae)

Schott & Endlicher: 32 (1832); Hallé: 22 (1961); Wild: 561 (1961); Germain: 261 (1963); Wild & Gonçalves: 53 (1979b); Lebrun & Stork:702 (2003); Phiri (Unpublished).

Tall trees with straight, smooth trunk; young branches minutely stellate-puberulous. **Leaves** entire or palmatilobed, 5–9-nerved from base, petiolate. **Flowers** unisexual, in axillary panicles. **Calyx** campanulate, 5-lobed. **Petals** absent. **Male flowers**: androphore with an apical ring of anthers in one or more rows. **Female flowers** with a perianth as in male; ovary of 5 sessile or shortly stipitate coherent carpels; styles connate; stigmas 5, recurved; ovules many. **Fruit** of 1–5 large woody follieles. **Seeds** many, with a large wing; endosperm present.

Species 15, tropical, especially Old World; sthn trop. Afr. 2, Angola (Cabinda), Zambia.

Scaphopetalum Mast.

(Byttnerioideae)

Masters: 28 (1867); Masters: 236 (1868a); Exell & Mendonça: 198 (1937/51); Germain: 302 (1961); Germain: 212 (1963); Lebrun & Stork: 702 (2003).

Shrubs; young branches puberulous, later glabrous. **Leaves** alternate, simple, shortly petiolate, entire, elliptic, penninerved with one basal pair of nerves; stipules triangular to ensiform, subpersistent. **Inflorescences** few- to many-flowered axillary or sometimes cauline fascicles surrounded at base by pointed bracts; pedicels slender, articulated at base of flower; pointed bracteoles present on pedicel; bud spherical. **Calyx** coriaceous with sepals ± completely fused, bursting irregularly into 2 or 3 valves. **Petals** 5, concave, hooded, striate outside with 7 longitudinal nerves. **Staminal tube** membranous, bell-shaped, 5-angular, ± clearly divided at apex into 10 segments, 5 of which are sterile, reflexed and rounded, alternating with 5 fertile lobes opposite petals and each bearing 3 sessile, 2-thecate anthers. **Ovary** subcylindric, obscurely 5-lobed, 5-locular, pubescent; ovules in 1 or 2 rows on central placenta; style simple; stigma minute. **Fruit** an elliptic to subconical loculicidal capsule crowned by persistent calyx and opening by 5 undulate valves. **Seeds** ± 2–4 per carpel, ± ovoid, pubescent, partly covered by an irregularly dentate aril.

Species 15, trop. Africa; sthn trop. Afr. 1: *Scaphopetalum dewevrei* De Wild., Angola (Cabinda).

Sida L.
(Malvoideae)

Exell & Mendonça: 147, (1937/1951); Meeuse: 475 (1961); Meeuse & Gonçalves: 75 (1979); Lebrun & Stork: 750 (2003).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sparrmannia L.f.
(Grewioideae)

Exell & Mendonça: 238 (1937/1951); Wild: 78 (1963); Wild & Gonçalves: 52 (1969); Verdcourt: 93 (2001); White *et al.*: 572 (2001); Coates Palgrave: 683 (2002).

Sthn trop. Afr. 1: *Sparrmannia ricinocarpa* (Eckl. & Zeyh.) Kuntze, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sterculia L.
(Sterculioideae)

Exell & Mendonça: 199 (1937/1951); Wild: 551 (1961); Wild & Gonçalves: 38 (1979b); Fourie & Retief: 1999 (1989); White *et al.*: 562 (2001); Coates Palgrave: 713 (2002); Forster & Guymer: 445 (2002); Izidine & Bandeira: 52 (2002); Lebrun & Stork: 704 (2003).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Thespesia Sol. ex Corrêa
(Malvoideae)

Exell: 421 (1961); Fryxell: 301 (1968); Exell & Gonçalves: 3 (1979); Coates Palgrave: 703 (2002).

Thespesiopsis Exell & Hillc.; Exell & Gonçalves: 6 (1979); Izidine & Bandeira: 58 (2002) under Malpighiaceae.

Sthn trop. Afr. 3, Mozambique, and sthn Afr.

Triplochiton K.Schum.
(Helicteroideae)

Schumann: 330 (1900), name conserved; Wild: 549 (1961); White: 247 (1962); Hallé: 111 (1961); Germain: 208 (1963); Coates Palgrave: 713 (2002).

Large trees with a straight bole and light grey, smooth flaking bark. **Leaves** palmately 5–9-lobed, cordate; lobes ovate to oblong; petiolate; stipules present. **Flowers** bisexual, in reduced axillary cymes or many-flowered panicles; bracts present and also 3 bracteoles forming a deciduous involucre beneath calyx. **Calyx** campanulate with 5 valvate lobes. **Petals** 5, with contorted aestivation, tomentose, with a basal claw. **Androgynophore** conspicuous. **Stamens** many; staminodes 5, ovate, with a contorted aestivation. **Ovary** of 5 coherent carpels and with 5 coherent styles; ovules ± 12 per carpel, 2-seriate. **Fruit** of 5 samara-like, single-seeded carpels each with a unilaterally produced wing.

Species 3, trop. Africa; sthn trop. Afr. 1: *Triplochiton zambesiacus* Milne-Redh., Zambia, Zimbabwe.

Triumfetta L.
(Grewioideae)

Exell & Mendonça: 225 (1937/1951); Wild: 63 (1963); Wild & Gonçalves: 37 (1969); Brummitt & Seyani: 709 (1978); Cheek: 67 (2001).

Ceratosepalum Oliv.; Burtt Davy *et al.*: 98 (1958).

Sthn trop. Afr. ± 35, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Urena L.
(Malvoideae)

Exell & Mendonça: 155 (1937/1951); Meeuse: 503 (1961); Meeuse & Gonçalves: 113 (1979).

Sthn trop. Afr. 1: **Urena lobata* L., a pantropical weed, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Waltheria L.
(Byttnerioideae)

Exell & Mendonça: 192 (1937/1951); Wild: 536 (1961); Wild & Gonçalves: 24 (1979b); Germain: 258 (1963).

Sthn trop. Afr. 1: *Waltheria indica* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Wissadula Medik.
(Malvoideae)

Exell & Mendonça: 150, 373 (1937/1951); Meeuse: 499 (1961); Meeuse & Gonçalves: 109 (1979); Krapovickas: 94 (1996).

Sthn trop. Afr. 1: *Wissadula rostrata* (Schumach. & Thonn.) Hook.f., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Melastomataceae

(Rosidae—Myrtales)
(Rosids—Myrtales)

Bredenkamp, C.L. in Leistner: 352 (2000).

Sthn trop. Afr.: genera ?17, species ± 100.

Renner: 519 (1993) recognises the Memecyloideae as a separate family (Memecylaceae).

Following Jacques-Félix (1983), the prolongation of the connective below the anther thecae is referred to as a pedoconnective.

Key to genera

1a Ovary 1-locular or imperfectly 2–4-locular with only 1 locule developing; anthers short, longitudinally dehiscent; placentation basal with 2–18 ovules; fruit a 1- or 2-seeded berry; seeds large; trees or shrubs with glabrous leaves ..... (Memecyloideae):

2a Leaves with only 1(3) prominent longitudinal nerve; leaf surface uneven; calyx entire or with valvate lobes; petals often sessile; fruit spherical or ellipsoid ..... **Memecylon**

2b Leaves with 3 prominent longitudinal nerves; a polygonal network of veins is often visible; leaves rarely subcordate:

3a Cymes pubescent in all parts, branched and often ample; leaf surface granular, especially below; fruits crowned by the truncate to wavy remnants of the calyx ..... **Spathandra**

3b Cymes glabrous, variously branched or glomerate:

4a Bracts persistent at all articulations of the inflorescence, including the bracts immediately below the sessile flowers; leaf surface mostly granular; ovary with 2 ovules; fruit spherical, without prominent remnants of calyx ..... **Lijndenia**

4b Bracts usually caducous; flowers at least briefly pedicellate; leaf surface smooth; ovary with many ovules; fruits spherical or ellipsoid, crowned by the persistent calyx ..... **Warneckea**

1b Ovary 3–5-locular with many ovules on axile placentas; anthers mostly fairly long, opening by an apical pore; fruit a capsule with many minute seeds; herbs, shrubs or sometimes small trees, usually with variously hairy leaves ..... (Melastomatoideae):

5a Calyx entire to shallowly undulate: lobes ± absent; top of ovary convex, glabrous; fruit indehiscent, dry or baccate, not angular; seeds straight or slightly curved (Dissochaeteae):

6a Leaves arising on the same node equal, elliptic; young branches rounded, covered with minute rusty hairs; stamens equal ..... **Ochthocharis**

6b Leaves arising on the same node unequal, lanceolate-cordate; young branches 4-angled, glabrous; stamens unequal ..... **Dinophora**

5b Calyx distinctly lobed; top of ovary concave, convex or ± flat, variously hairy, scaly or glabrous; fruit a loculicidal capsule, 4- or 5-angular or rounded:

7a Ovary convex on top, usually with a crown of hairs, bristles or scales, usually adnate to the calyx tube by 8 or 10 longitudinal septa; calyx tube/receptacle ± ellipsoid; appendages between sepals often present; fruit not angular; seeds usually distinctly curved (cochleate), with a curved embryo (Osbeckieae):

8a Creeping annual herbs rooting at the nodes ..... **Guyonia**

8b Perennial herbs, subshrubs, shrubs or trees:

9a Trees or large shrubs; flowers 4-merous, produced before the leaves; pedoconnectives of anthers with linear appendages; seeds obovoid or subpyramidal with hyaline papillae dorsally ..... **Dichaetanthera**

9b Plants not possessing all the above characters:

10a Calyx provided with appendages between the sepals, if absent then the calyx tube/receptacle glabrous; sepals early or tardily caducous, rarely persistent:

11a Stamens usually very unequal, the longer ones with long pedoconnectives with a forked appendage, the shorter ones with a short pedoconnective with 2 tubercles (if stamens subequal than pedoconnectives conspicuous at least on the longer stamens); sepals not or tardily caducous ..... **Dissotis**

11b Stamens equal:

12a Shrubs; flowers 5-merous ..... **Pseudosbeckia**

12b Erect, usually unbranched annuals; flowers 4-merous ..... **Antherotoma**

10b Calyx without appendages between the sepals:

13a Stamens ± equal, with slightly attenuate, not rostrate anthers; bristles of calyx tube/receptacle in 1–several, complete or incomplete rings; fruit a berry-like capsule bursting irregularly ..... **Tristemma**

13b Stamens usually very unequal, with rather attenuate-rostrate anthers; bristles of calyx tube/receptacle, if present, not in rings; fruit a valved capsule ..... **Melastomastrum**

7b Ovary depressed: the upper side ± flat or concave, glabrous but often with a crown of scales, adnate to the calyx tube by longitudinal septa or wholly adnate; calyx tube/receptacle and fruit generally ± 4- or 5-angled, without appendages between sepals; seeds straight to slightly curved, with embryo ± straight (Sonerileae):

14a Plants stemless; usually only with a leaf and a ± long-peduncled cyme arising from a scaly tuber ..... **Cincinnobotrys**

14b Plants with stems; leaves ± numerous, arising on stems and branches; inflorescences axillary or terminal:

15a Flowers in terminal, simple to forked scorpioid cymes; stamens ± identical, with a small scale-like anterior appendage ..... **Calvoa**

15b Flowers in variously arranged cymes; stamens of outer and inner whorl usually clearly different:

16a Anterior appendage of anthers, at least in anthers of the outer whorl, simple, club-shaped or linear ..... **Amphiblemma**
16b Anterior appendage of anthers, at least in anthers of the outer whorl, 2-forked from the base, awl-shaped or linear ..... **Dicellandra**

Amphiblemma Naudin

(Melastomatoideae—Sonerileae)

Naudin: t. 7, fig. 7, (1850); Naudin: 50 (1851); Hooker: 455 (1871); Fernandes & Fernandes: 163 (1970); Jacques-Félix: 429 (1973); Jacques-Félix: 75 (1983).

Perennial herbs, subshrubs or shrubs of medium height with sympodial growth; floral organs often with glandular hairs. **Leaves** long-petioled, membranous, longitudinally 3- to 5-nerved, ± ovate. **Inflorescences** simple or branched, terminal or axillary scorpioid cymes. **Calyx**: tube/receptacle turbinate to campanulate, produced beyond ovary; limb 5-toothed, dilated, deciduous. **Petals** 5, oblong or obovate, pink or white, often conspicuous. **Stamens** 10, in 2 unequal whorls; longer anthers linear-subulate with elongate, curved connective and an anterior appendage at base and sometimes a spur behind; shorter anthers with connective rarely produced. **Ovary** 5-locular, 5-angled, with 5 facets that have membranous margins; ovules few to many; style linear, stigma punctiform. **Capsule** turbinate, 5-locular, 5-valved at top, with an entire to 5-lobed crown. **Seeds** minute, obovoid; funicle ± fragile; raphe produced into a broad appendage.

Species 13, tropical W Africa; sthn trop. Afr. 3, Angola.

Antherotoma (Naudin) Hook.f.

(Melastomatoideae—Osbeckieae)

Fernandes & Fernandes: 124 (1970); Wickens: 9 (1975); Fernandes & Fernandes: 229 (1978); Fernandes & Fernandes: 12 (1980); Lebrun & Stork: 530 (2003).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Calvoa Hook.f.

(Melastomatoideae—Sonerileae)

Hooker: 732, 755 (1867); Hooker: 457 (1871); Fernandes & Fernandes: 162 (1970); Wickens: 63 (1975); Jacques-Félix: 123 (1981a); Jacques-Félix: 58 (1983); Figueiredo: 179 (2001).

Perennial herbs, subshrubs or shrubs, often ± succulent; branches terete or 4-angled, often with thickened nodes. **Leaves** opposite, short- to long-petiolate, lanceolate to broadly ovate, longitudinally 3- to 5-nerved. **Inflorescences** scorpioid cymes, simple, bi- to several times furcate. **Flowers** sessile or shortly pedicelled; relatively small. **Calyx**: tube/hypanthium campanulate or obconic, produced beyond ovary; limb 5-toothed, deciduous. **Petals** 5, obovate or oblong, ± asymmetric, often adhering at base. **Stamens** 10, equal or outer ones slightly longer, of similar shape or anterior appendix slightly different; anthers oblong, ± sausage-shaped, connective short, flattened, often strongly curved, anterior appendage usually scale-like, obtuse or truncate in outer whorl, larger, broader and dish-shaped and ± denticulate in inner whorl, spur situated towards middle of connective; filaments flattened, often adhering at point of origin on petals. **Ovary** 3–5-locular, adhering to calyx tube, with an entire to 3–5-lobed epigynous crown; style short, ± sigmoid; stigma capitate; ovules many. **Capsule** included in coriaceous, campanulate, ribbed calyx tube, and surmounted by accrescent crown. **Seeds** minute, oblong or obovoid.

Species 18, W and C trop. Africa; sthn trop. Afr. 3, Angola.

Cincinnobotrys Gilg

(Melastomatoideae—Sonerileae)

Gilg: 265 (1897); Wickens: 66 (1975); Bingham & Smith: 153 (2002).

Haplophyllophorus (Brenan) A.Fern. & R.Fern.: 70 (1972); Fernandes & Fernandes: 274 (1978). *Amphiblemma* sect. *Haplophyllophora* Brenan: 85 (1953); Lebrun & Stork: 534 (2003).

Acaulescent herbs with 1(2) leaves and inflorescences arising from a bulbil-bearing rhizome; bulbils densely covered with stellate bristles. **Leaves** broadly ovate-cordate, serrulate with teeth ending in a bristle, longitudinally 5–9-nerved, petiolate. **Flowers** 5(4)-merous, in subscorpioid, single or branched cymes. **Calyx**: tube/receptacle turbinate, hispid; lobes triangular, persistent. **Petals** ovate, obovate or oblong, pale pink. **Stamens** 10(8), very unequal; anthers of long stamens dehiscing by a terminal, broad, oblique pore and with a long pedoconnective anticously furnished with an upcurved, clavate, entire or bilobed appendage; anthers of short stamens abortive. **Ovary** 5(4)-locular, adherent to calyx tube/receptacle nearly to top; style columnar with a dilated subcapitate stigma. **Capsule** turbinate, crowned by 5 scales. **Seeds** very small, straight, straw-coloured with a lateral appendage at top.

Species 7; trop. Africa; sthn trop. Afr. 1: *Cincinnobotrys acaulis* (Cogn.) Gilg, Angola, and Zambia.

Dicellandra Hook.f.

(Melastomatoideae—Sonerileae)

Hooker: 732, 757 (1867); Fernandes & Fernandes: 161 (1970); Jacques-Félix: 77 (1974); Wickens: 69 (1975); Jacques-Félix: 90 (1983).

Herbs or subshrubs, sometimes scandent or epiphytes; branches 4-angled, winged or with acute angles, capable of rooting along entire surface. **Leaves** large, long-petiolate, usually unequal on same node, ovate-lanceolate to elliptic, longitudinally 5- to 7-nerved; base rounded to cordate. **Inflorescence** a many-flowered, terminal, oblong to pyramidal panicle of cymes, with 5 or 6 flowering nodes, or cymes sessile and flowers fascicled. **Calyx**: tube/receptacle campanulate-turbinate, sometimes slightly angular; lobes (4)5, short, broadly triangular or rounded. **Petals** (4)5, lanceolate to oblong-lanceolate. **Stamens** (8–)10 in 2 whorls, stamens of outer one usually slightly longer, with 2 anterior appendages and a spur; stamens of inner whorl usually shorter with shorter appendages; anthers linear-subulate, larger ones sometimes curved and attenuate at base. **Ovary** (4)5-locular, partly adnate to calyx, apex truncate with a membranous or slightly thickened crown. **Fruit** a capsule within accrescent calyx; crown persisting or disappearing but not accrescent. **Seeds** semi-elliptic or obovoid, attenuate at base; raphe produced into a lateral spur near apex.

Species 3, trop. Africa; sthn trop. Afr. 1: *Dicellandra barteri* Hook.f., Angola.

Dichaetanthera Endl.

(Melastomatoideae—Osbeckieae)

Endlicher: 1215 (1840); Jacques-Felix: 37 (1955); White: 305 (1962); Fernandes & Fernandes: 159 (1970); Wickens: 13 (1975); Fernandes & Fernandes: 269 (1978); Jacques-Félix: 34 (1983); Bingham & Smith: 153 (2002).

Sakersia Hook.f.; Exell: 183 (1929).

Trees or shrubs, strigillose with rigid bristles; branches ± distinctly 4-angled. **Leaves** opposite, subentire, with 5–7 longitudinal nerves. **Flowers** 4-merous, pedicellate, arranged in terminal panicles, produced before leaves; bracts 2, caducous. **Sepals** short, persistent; intersepalar segments absent. **Petals** obovate or oblong, pink or mauve to magenta. **Stamens** 8, unequal; filaments filiform; anthers linear-subulate, sigmoid, 1-porose, with undulate thecae; pedoconnective rather long with 2 linear anterior appendages at base. **Ovary** 4-locular, adnate to calyx tube/receptacle by 8 septa; style filiform, somewhat thickened distally; stigma punctiform. **Capsule** 4-valved. **Seeds** very many, obovoid or subpyramidal, with hyaline papillae on back; hilum basal.

Species 34, mainly Madagascar, 7 in trop. Africa; sthn trop. Afr. 5, Angola, Zambia.

Dinophora Benth.

(Melastomatoideae—Dissochaeteae)

Bentham: 355 (1849); Keay: 252 (1954); Fernandes & Fernandes: 159 (1970); Jacques-Félix: 110 (1983).

Glabrous shrubs, sparsely branched; branches slender, 4-angular. **Leaves** opposite, unequal at same node, petiolate, lanceolate-cordate, acutely acuminate, 5- or 7-nerved at base, serrate with mucronate teeth. **Flowers** in lax terminal dichotomous panicles; pedicels slender. **Calyx**: tube/receptacle smooth, short, entire or faintly dentate. **Petals** 5, ovate-lanceolate, pink. **Stamens** 10, in 2 subequal whorls; outer stamens with connective produced below and anterior appendage 2-lobed; inner ones with curved anther and connective not produced but with 2 anterior tubercles. **Ovary** adhering to calyx tube/receptacle by 5 ribs, glabrous, apex convex; style thick, sigmoid; stigma punctiform. **Fruit** broadly ellipsoid, with very thin walls, splitting irregularly. **Seeds**: hilum large; embryo curved.

Monotypic genus: *Dinophora spenneroides* Benth., tropical W Africa; sthn trop. Afr.: Angola (Cabinda).

Dissotis Benth.

(Melastomatoideae—Osbeckieae)

Fernandes & Fernandes: 132 (1970); Fernandes & Fernandes: 68 (1972); Wickens: 22 (1975); Fernandes & Fernandes: 240 (1978); Fernandes & Fernandes: 18 (1980); White *et al.*: 356 (2001); Izidine & Bandeira: 51 (2002); Msekandiana & Mlangeni: 36 (2002); Lebrun & Stork: 536 (2003).

Heterotis Benth. in part; Jacques-Félix: 417 (1981b); Jacques-Félix: 25 (1983). *Osbeckia* L. in part; Fernandes & Fernandes: 129 (1970); Wickens: 11 (1975); Fernandes & Fernandes: 235 (1978); Jacques-Félix: 282 (1995).

Sthn trop. Afr. ± 45, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Guyonia Naudin

(Melastomatoideae—Osbeckieae)

Naudin: 149 (1850); Hooker: 443 (1871); Keay: 246 (1954); Fernandes & Fernandes: 124 (1970); Wickens: 7 (1975); Jacques-Félix: 6 (1983).

Annual herbs; stems creeping, rooting at nodes, branches erect, 4-angled. **Leaves** decussate, petiolate, ± ovate, membranous, crenulate, sparsely setose above and on nerves beneath; nerves 3–5, parallel-convergent. **Flowers** (4)5(–7)-merous, terminal or axillary, solitary or 2 or 3 together subtended, but not enveloped by a caducous dentate-ciliate bract. **Calyx**: tube/receptacle ovoid; lobes linear-triangular, persistent, without intersepalar appendages. **Petals** obovate, delicate, pale pink. **Stamens** equal to slightly unequal; anthers ovoid to oblong-ellipsoid; connective produced below anther, with 2 inconspicuous tubercular anterior protuberances at junction with filament. **Ovary** adherent to calyx tube in lower half, ovoid, glabrous; style sigmoid; stigma capitate. **Fruit** a valvate capsule within membranous calyx which tends to rupture irregularly. **Seeds** relatively large and few, attenuate towards funicular end, upper half rounded, tuberculate or papillose.

Species 2, tropical W Africa; sthn trop. Afr. 1: *Guyonia ciliata* Hook.f., Angola.

Lijndenia Zoll. & Moritzi

(Memecyloideae—Memecyleae)

Bremer: 121 (1982) distinguishes this genus from *Memecylon* and mentions *M. zambeziense* A.Fern. & R.Fern. from Zambia as possibly belonging to this genus. *Lijndenia barteri* (Hook.f.) Bremer may occur in Mozambique, fide Jacques-Félix: 141–142 (1983).

Melastomastrum Naudin

(Melastomatoideae—Osbeckieae)

Fernandes & Fernandes: 129 (1970); Wickens: 19 (1975); Fernandes & Fernandes: 237 (1978); Jacques-Félix: 31 (1983).

Heterotis Benth.; Jacques-Félix: 417 (1981b).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, and sthn Afr.

Memecylon L.

(Memecyloideae—Memecyleae)

Fernandes & Fernandes: 116 (1970); Wickens: 76 (1975); Fernandes & Fernandes: 63 (1972); Fernandes & Fernandes: 221 (1978); Fernandes & Fernandes: 3 (1980); Jacques-Félix: 113 (1983); White *et al.*: 358 (2001); Bingham & Smith: 142 (2002); Coates Palgrave: 842 (2002); Izidine & Bandeira: 51 (2002); Lebrun & Stork: 554 (2003).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ochthocharis Blume

(Melastomatoideae—Dissochaeteae)

Blume: 523 (1831); Hansen & Wickens: 13 (1981); Jacques-Félix: 106 (1983).

Phaeoneuron Gilg; Fernandes & Fernandes: 161 (1970); Fernandes & Fernandes: 272 (1978).

Perennial herbs, shrubs or undershrubs, young branches, petioles, peduncles and pedicels covered with minute rusty hairs.

Leaves opposite, usually ± equal at same node, ovate to broadly ovate, petiolate, with 5–7 longitudinal nerves. **Inflorescences** of terminal and axillary paniculate cymes. **Flowers** 5-merous. **Calyx**: tube/receptacle obovoid, shallowly undulate at margin, covered with very small brown hairs; lobes 0. **Petals** broadly ovate, ± oblique, violet or rose. **Stamens** 10, equal or subequal; anthers linear, straight, with pedoconnective produced into a posterior, thick ± square appendage and provided with 2 anterior subglobose tubercles. **Ovary** adnate by septa to inferior half of calyx tube/receptacle, 5-locular, with multiovulate placentas; style longer than stamens. **Fruit** capsular, dehiscing irregularly. **Seeds** many, curved.

Species 7: 5 tropical Asia, 2 trop. Africa; sthn trop. Afr. 1: *Ochthocharis dicellandroides* (Gilg) C.Hansen & Wickens, Angola, Zambia.

Pseudosbeckia A.Fern. & R.Fern.

(Melastomatoideae—Osbeckieae)

Fernandes & Fernandes: 167 (1956); Fernandes & Fernandes: 233 (1978); Fernandes & Fernandes: 16 (1980); Izidine & Bandeira: 51 (2002); Mapaura & Timberlake: 175 (2002).

Shrubs with young branches 4-angled, ± densely bristly. **Leaves** opposite, elliptic to ovate, longitudinally (3)5-nerved, subentire or crenulated, dark green above, yellowish green below. **Flowers** 5-merous; in terminal few-flowered cymes or solitary; bracts caducous. **Sepals** tardily deciduous; intersepalar segments subulate. **Petals** obovate. **Stamens** 10, equal; filaments straight; anthers oblong-lanceolate, straight, yellow, with rather undulate thecae and 1 extrorse pore; pedoconnective very short with 2 anterior, divergent, obtuse appendages and 2 posterior minute prominences at base. **Ovary** 5-locular, adnate to calyx tube/receptacle by 10 longitudinal septa; style filiform; stigma punctiform. **Capsule** 5-valved. **Seeds** cochleate, covered with rather elongate tubercles arranged in curved parallel lines.

Monotypic: *Pseudosbeckia swynnertonii* (Baker f.) A.Fern. & R.Fern., known only in sthn trop. Afr.: Zimbabwe, Mozambique.

Spathandra Guill. & Perr.

(Memecyloideae—Memecyleae)

Guillemin & Perrotet: 313 (1833); Jacques-Félix: 225 (1978); Jacques-Félix: 138 (1983).

Memecylon L. in part; Keay: 263 (1954); Fernandes & Fernandes: 120 (1970).

Shrubs or trees; branches rounded. **Leaves** large, coriaceous, subsessile; lamina ovate-elliptic, entire, veins parallel-convergent, 3 strong, 2 marginal ones weak. **Inflorescences** many-flowered, stipitate, puberulose cymes with well-developed peduncles and pedicels, terminal, axillary or on old wood; prefloral branches and flowers often umbellate; bracteoles at base of pedicels, not immediately below calyx. **Calyx**: tube/receptacle deeply cup-shaped with broadly triangular lobes. **Petals** triangular, valvate in bud, blue, white or purple. **Stamens**: anthers erect, connective ± parallel, curved towards back, with a gland, divergent only at base. **Ovary** 1-locular, without any partitions or parietal projections; ovules 6–8 on a central placenta; style filiform; stigma capitate. **Fruit** spherical, crowned with remains of calyx. **Seeds** 1(2); embryo curved, cotyledons foliaceous, hemispheric.

Species 5, trop. Africa and Madagascar; sthn trop. Afr. 1: *Spathandra blakeoides* (G.Don) Jacq.-Fél., Angola.

Tristemma Juss.

(Memecyloideae—Osbeckieae)

Jussieu: 329 (1789); Fernandes & Fernandes: 125 (1970); Wickens: 16 (1975); Fernandes & Fernandes: 231 (1978); Fernandes & Fernandes: 13 (1980); Jacques-Félix: 41 (1983); Lebrun & Stork: 562 (2003).

Perennial herbs or shrubs, with sharply 4-angular or -winged stems and branches, hairy or bristly. **Leaves** opposite, longitudinally 5–7-nerved. **Flowers** 5-merous, sessile or subsessile, in terminal heads surrounded by leaves and leafy bracts; inner bracts coriaceous, chaffy or membranous. **Calyx**: tube/receptacle ovoid or ovoid-oblong, glabrous or densely setose in upper half or with 1–6 rings of bristles; lobes persistent, ± reflexed, ciliate at margin; intersepalar segments 0. **Petals** mauve, pink or blue-violet rarely white. **Stamens** 10, subequal; anthers lanceolate, all similar, yellow, pedoconnective short with an anterior 2-lobed or 2-fid appendage at base. **Ovary** 5-locular, adnate to calyx tube/receptacle all around to above middle. **Capsule** 5-valved, with fleshy placentas, usually splitting irregularly. **Seeds** many, cochleate.

Species 15, trop. Africa to Madagascar; sthn trop. Afr. ± 4, Angola, Zambia, Zimbabwe, Mozambique.

Warneckea Gilg

(Memecyloideae—Memecyleae)

Gilg: 100 (1904); Jacques-Félix: 228 (1978); Bremer: 121 (1982); Jacques-Félix: 142 (1983); Borhidi: 149 (1993); Coates Palgrave: 843 (2002); Mapaura & Timberlake: 166 (2002).

Memecylon L. in part; Fernandes & Fernandes: 116 (1970); Fernandes & Fernandes: 220 (1978).

Trees or shrubs; young branchlets 4-angled to subterete, usually thickened at nodes, later terete. **Leaves** subsessile to shortly petiolate, longitudinally 3-nerved, lateral nerves mostly not merging with middle nerve near apex; sphaeroidal sclereids present and surface therefore often granular. **Inflorescences** (1)2- to many-flowered cymes, axillary or on old wood, sometimes arranged in axillary panicles; bracts minute. **Flowers** 4-merous, small. **Calyx**: tube/receptacle subhemispheric to broadly campanulate; limb 4-toothed or -lobed. **Petals** broadly ovate, whitish or bluish. **Stamens** 8, equal, sometimes 4 with abortive anthers. **Ovary** 1-locular, adherent to calyx tube/receptacle; style filiform; ovules 2–12, on a central placenta. **Fruit** a ± globose 1(2)-seeded berry crowned by persistent calyx. **Seeds** large; embryo straight, without hypocotyl, cotyledons unequal or 1 rudimentary.

Species ± 30, trop. Africa; sthn trop. Afr. 8, Angola, Zambia, Malawi, Mozambique.

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Meliaceae

(Rosidae—Sapindales)
(Eurosids II—Sapindales)

Archer, R.H. in Leistner: 353(2000).

Sthn trop. Afr.: genera ?14, species ± 46.

Key to genera

[after Styles & White (1991)]

1a Leaves imparipinnate, pinnately 3-foliolate, simple or 2–3-pinnate; fruit a berry or a drupe or a small loculicidal capsule; seeds neither winged nor with a corky covering, often arillate:

2a Leaves simple; style head expanded to form a *receptaculum pollinis* (pollen presenter); fruit a small capsule; seeds arillate ..... **Turraea**

2b Leaves compound:

3a Leaves 2–3-pinnate; staminal tube complete, with appendages; fruit a drupe ..... ***Melia**

3b Leaves pinnate; if fruit drupaceous then staminal tube incomplete (*Lepidotrichilia*) or without appendages (*Ekebergia*):

4a Anthers arising within the throat of the staminal tube:

5a Petals fused to the staminal tube for the greater part of its length; petioles not grooved and winged at the base ..... **Turraeanthus**

5b Petals free from staminal tube; petioles deeply grooved and winged at the base ..... **Guarea**
4b Anthers arising apically on the margin of the staminal tube or filaments; petals not fused to the staminal tube for the greater part of its length:
6a Fruit a capsule:
7a Capsule with 5 thick woody valves covered with conspicuous ridges and antler-like appendages ..... **Pseudobersama**
7b Capsule with 2–3(4) leathery valves without antler-like appendages ..... **Trichilia**
6b Fruit a drupe:
8a Indumentum stellate; staminal tube incomplete; filaments with paired appendages ..... **Lepidotrichilia**
8b Indumentum simple; staminal tube complete, without appendages ..... **Ekebergia**
1b Leaves paripinnate; fruit a septicidal capsule; seeds winged or with a thick corky or woody outer covering:
9a Flowers with an androgynophore to which the bases of the petals are adnate; stamens 5, free ..... ***Toona**
9b Flowers without an androgynophore; petals free; stamens 8–10, filaments partly or completely united:
10a Capsule with a well-developed columella; seeds winged:
11a Capsule globose or subglobose; seeds orbicular to suborbicular, winged all the way round ..... **Khaya**
11b Capsule elongate, at least twice as long as broad; seeds with a terminal wing:
12a Seeds attached by the wing-end towards the distal end (apex) of the columella (i. e. seed winged above); flowers 4-merous ..... **Lovoa**
12b Seeds attached by the seed-end towards the distal end (apex) of the columella (i. e. seed winged below); flowers 5-merous; leaflets entire ..... **Entandrophragma**
10b Capsule with a rudimentary columella; seeds unwinged, with a corky or woody outer covering:
13a Inflorescence much branched; sepals imbricate, ± free to the base; leaflets in 6–18 or more pairs; seeds with a woody covering ..... **Carapa**
13b Inflorescence little branched; sepals valvate, united in the lower half; leaflets in (1)2, 3(4) pairs; seeds with a corky covering ... **Xylocarpus**

Carapa Aubl.

Exell & Mendonça: 311 (1951); Styles & White: 61 (1991).

Trees of very variable habit. **Leaves** usually paripinnate, and with an apical gland, mostly crowded at ends of stout branchlets. **Flowers** unisexual, 4- or 5(6)-merous, in large, much-branched panicles. **Calyx** small, lobed almost to base; lobes imbricate. **Petals** 4 or 5(6), slightly contorted, spreading in open flowers. **Staminal tube** urceolate, bearing 6–8 included anthers or antherodes towards apex and terminated by 8–10 suborbicular, emarginated or irregularly lobed, overlapping appendages alternating with anthers or antherodes. **Disc** cushion-shaped, surrounding base of ovary and free from staminal tube. **Ovary** 4 or 5(6)-locular with 2–8 ovules in each locule; style-head discoid with a crenular margin. **Fruit** a large, pendulous, leathery, subglobose, septifragal capsule, breaking open on hitting ground; columella poorly developed. **Seeds** ± 12–20, large, subangular, with a woody but buoyant outer covering.

Species 2 or 3, tropical America and Africa; sthn trop. Afr. 1: *Carapa procera* DC., Angola.

Ekebergia Sparrm.

Exell & Mendonça: 315 (1951); White & Styles: 315 (1963); White *et al.*: 31 (1979); Styles & White: 37 (1991); White *et al.*: 361 (2001); Coates Palgrave: 451 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Entandrophragma C.DC.

Exell: 64 (1927) as *Entandophragma*; Exell & Mendonça: 308 (1951); Gossweiler: 179 (1953); Staner & Gilbert: 180 (1958); White & Styles: 289 (1963); White *et al.*: 41 (1979); Styles & White: 49 (1991); De Winter & Condy: 74 (1999); White *et al.*: 361 (2001); Coates Palgrave: 445 (2002); Dombo *et al.*: 10 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Guarea L.

Linnaeus: 150, 228 (1771); Staner & Gilbert: 201 (1958); Pennington & Styles: 494 (1975); Styles & White: 40 (1991); Brummitt (Unpublished).

Dioecious trees or treelets; indumentum of simple hairs. **Leaves** pinnate, with a dormant terminal bud or more rarely a terminal leaflet; leaflets 8–15, oblong-elliptic, entire. **Calyx** irregularly lobed. **Petals** 5, free from staminal tube. **Staminal tube** cylindric; anthers 10, arising in throat of staminal tube and completely included. **Disc** annular at base of ovary. **Ovary** 3–5-locular; locules with 1 or 2 ovules; style head discoid with a small central depression. **Fruit** a cleistocarp, indehiscent or breaking up after falling. **Seeds** large, completely covered by a thin yellow aril.

Species 40, 35 in the Neotropics, 5 in trop. Africa; sthn trop. Afr. 1: *Guarea mayombensis* Pellegrin, Angola.

Khaya A.Juss.

Exell & Mendonça: 307 (1951); White & Styles: 287 (1963); White *et al.*: 37 (1979); Styles & White: 46 (1991); White *et al.*: 363 (2001); Coates Palgrave: 444 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and cultivated in sthn Afr.

Lepidotrichilia (Harms) J.-F.Leroy

Leroy: 1025 (1958); White & Styles: 305 (1963); Pennington & Styles: 473 (1975); White *et al.*: 365 (2001); Phiri (Unpublished).

Small or medium-sized evergreen trees; bole fluted; bark smooth, grey. **Leaves** imparipinnate, densely stellate-pubescent; leaflets opposite or alternate, 3- or 4-jugate, entire, lower surface with minute red and black glands. **Flowers** bisexual, borne in large cymose panicles. **Calyx** cupuliform with 5 minute teeth. **Petals** 5, free, much longer than calyx in bud, induplicate-valvate, creamy white, becoming darker yellow with age. **Filaments** 10, fused in lower half to form a staminal tube; anthers arising between a pair of deltate-acuminate appendages which slightly exceed them in length. **Disc** absent but base of staminal tube apparently slightly modified for nectar secretion. **Ovary** 2(3)-locular, each locule with 1 ovule; style

head capitate, surmounted by 2 or 3 erect stigmatic lobes. **Fruit** drupaceous, indehiscent.

Species 4, 3 in Madagascar, 1 in trop. Africa: *Lepidotrichilia volkensii* (Gürke) J.-F.Leroy; sthn trop. Afr.: Zambia, Malawi.

Lovoa Harms

Harms: 164 (1896); Exell & Mendonça: 311 (1951); Staner & Gilbert: 193 (1958); White & Styles: 293 (1963); Pennington & Styles: 523 (1975); White *et al.*: 45 (1979); Styles & White: 58 (1991); Coates Palgrave: 446 (2002); Dombo *et al.*: 10 (2002); Mapaura & Timberlake: 166 (2002).

Large, evergreen, monoecious trees; bole fluted or slightly buttressed at base. **Leaves** paripinnate; leaflets opposite or alternate, 3–5(6)-jugate, entire. **Flowers** unisexual, borne in large panicles. **Calyx** lobed almost to base; lobes 2 + 2, imbricate, outer larger than inner ones. **Petals** 4, free, white, much longer than calyx in bud, imbricate. **Staminal tube** shortly cylindric or cup-shaped, margin entire or with very short, broad teeth or with paired deltate-acuminate appendages alternating with anthers; anthers 8. **Disc** short, broad, cushion-shaped, enveloping base of ovary, but free from staminal tube. **Ovary** 4-locular, each locule with 2 rows of 2 ovules; style short; style head capitate, obscurely 4-lobed. **Fruit** a pendulous, elongate, tetragonal, woody, septifragal capsule, dehiscing from apex or from apex and base simultaneously; columella extending to apex of capsule, 4-ridged, softly woody, each face slightly indented with imprints of 1 or 2 seeds. **Seeds** 2(4) per locule, but only 1 or 2 fertile, attached to apex of columella by winged end of seed and leaving inconspicuous scars on falling.

Species 2 or 3, confined to evergreen forest in trop. Africa; sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique.

***Melia** L.

Exell & Mendonça: 317 (1951); White & Styles: 315 (1963); White *et al.*: 16 (1979); Styles & White: 22 (1991); White *et al.*: 365 (2001); Coates Palgrave: 451 (2002).

Sthn trop. Afr. 1: **Melia azedarach* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr., widely cultivated and naturalised in many areas.

Pseudobersama Verdc.

White & Styles: 304 (1963); Pennington & Styles: 469 (1975); White *et al.*: 27 (1979); Styles & White: 27 (1991); Gasson & Cheek: 753 (1992); Coates Palgrave: 455 (2002).

Monotypic genus: *Pseudobersama mossambicensis* (Sim) Verdc., trop. Africa; sthn trop. Afr.: Mozambique, and sthn Afr. (KwaZulu-Natal).

***Toona** (Endl.) M.Roem.

Roemer: 131, 139 (1846); White *et al.*: 35 (1979); Styles & White: 45 (1991); White *et al.*: 365 (2001); Coates Palgrave: 444 (2002).

Sthn trop. Afr. 1: **Toona ciliata* M.Roem. (=*Cedrela toona* Roxb. ex Rottb. & Willd.), cultivated and frequently naturalised in Zimbabwe and Malawi, sometimes subspontaneous in Mozambique, and in sthn Afr.

Trichilia P.Browne

Exell & Mendonça: 312 (1951); Gossweiler: 177 (1953); Staner & Gilbert: 157 (1958); White & Styles 297 (1963); White *et al.*: 18 (1979); Styles & White: 29 (1991); White *et al.*: 366 (2001); Coates Palgrave: 453 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Turraea L.

Exell & Mendonça: 318 (1951); White & Styles: 307 (1963); White *et al.*: 4 (1979); Dowsett-Lemaire & White: 79 (1990); Styles & White: 5 (1991); Cheek: 716 (1996); White *et al.*: 368 (2001); Coates Palgrave: 448 (2002).

Naregamia Wight & Arn.: 116 (1834); Exell & Mendonça: 320 (1951); Pennington & Styles: 454 (1975).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Turraeanthus Baill.

Baillon: 261 (1874); Exell & Mendonça: 317 (1951); Pennington & Styles: 493 (1975); Styles & White: 40 (1991).

Guarea L. in part; Hiern: 131 (1896).

Dioecious trees or treelets; indumentum of simple hairs. **Leaves** pinnate; leaflets without pellucid lines or dots. **Flowers** unisexual, in axillary panicles or ramiflorous. **Calyx** almost entire or shallowly and irregularly lobed. **Petals** 4 or 5(6), valvate, fused in upper half to staminal tube. **Staminal tube** 10–30 mm long, cylindric, slightly expanded at mouth, margin crenate or shallowly lobed; anthers 8–12, glabrous, in a single irregular whorl arising within throat of staminal tube, completely included or partly exserted. **Disc** absent. **Ovary** 4- or 5-locular; locules with 2 superposed or oblique axile ovules; style head discoid with a slight central depression. **Fruit** a somewhat fleshy, 3–5-valved, loculicidal capsule with 1-seeded locules. **Seeds** with a fleshy, non-vascularised sarcotesta; embryo with thick, plano-convex, superposed cotyledons, radicle included, usually near abaxial surface.

Species ?3, tropical W Africa; sthn trop. Afr. 1: *Turraeanthus africanus* (Welw. ex C.DC.) Pellegr., Angola.

Xylocarpus J.König

König: 2 (1784); White & Styles: 293 (1963); White *et al.*: 48 (1979); Styles & White: 63 (1991); Coates Palgrave: 447 (2002).

Trees of mangrove swamps and coastal scrub, often with pneumatophores or ribbon-like buttresses, probably monoecious. **Leaves** paripinnate; leaflets entire. **Flowers** probably unisexual, borne in compound cymes. **Calyx** lobed to or beyond middle, lobes 4, aestivation open. **Petals** 4, free, much longer than calyx in bud, contorted. **Staminal tube** urceolate, bearing 8 included anthers inside tube towards apex and terminated by 8 appendages alternating with anthers; appendages subcircular, retuse or shallowly and irregularly 2(3)-lobed. **Disc** large, red, cushion-shaped, situated beneath or engulfing and fused to ovary, free from staminal tube. **Ovary** 4-locular, each locule with 2–4 ovules; style short; style head discoid, almost completely blocking entrance to staminal tube, margin crenellate, upper surface with a minute central papilla with 4 radiating, (?)stigmatic grooves. **Fruit** a large, almost spherical, leathery, septifragal capsule, dehiscing by 4 valves; septa

thin, ultimately breaking down. **Seeds** 8–16, large, pyramidal or tetrahedral, with angular margins due to mutual compression, outer side somewhat rounded, attached by apex to placenta and so forming a spherical mass; outer integument thick, corky.

Species 2, widespread in the mangrove swamps and coastal scrub of the Old World; sthn trop. Afr. 2, Mozambique.

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Melianthaceae

(Rosidae—Sapindales)
(Rosids—Geraniales)

Archer, R.H. in Leistner: 356 (2000).

Sthn trop. Afr.: genus 1, species 5.

Bersama Fresen.

Exell & Mendonça: 93 (1954/1956); White: 544 (1966); White & Gonçalves: 1 (1969); Doweld: 75 (2001); White *et al.*: 372 (2001); Coates Palgrave: 659 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Menispermaceae

(Magnoliidae—Ranunculales)
(Eudicots—Ranunculales)

Jordaan, M. in Leistner: 356 (2000).

Sthn trop. Afr.: genera 19, species 42.

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Key to tribes (and Tiliacora)

[after Kessler (1993)]

1a Endosperm absent ..... 1. **PACHYONEAE**
1b Endosperm present:
2a Endosperm not ruminate ..... 4. **MENISPERMEAE**
2a Endosperm ruminate:
3a Endosperm strongly ruminate; cotyledons not foliaceous, appressed ..... 2. **ANOMOSPERMEAE** (only *Tiliacora*)
3b Endosperm weakly ruminate; cotyledons foliaceous, divaricate ..... 3. **TINOSPOREAE**

Key to genera (male plants)

1a Small trees, shrubs or subshrubs, sometimes scandent:
2a Spiny subshrubs ..... **Antizoma**
2b Unarmed small trees or shrubs ..... **Penianthus**
1b Lianas:
3a Leaves peltate or subpeltate:
4a Bracts conspicuous, enlarged in fruit; petals 1 or, if more, then united into a cup ..... **Cissampelos**
4b Bracts not conspicuous, not enlarged in fruit; petals 2–6, free:
5a Sepals 9, inner 3 united into a pseudocorolla; stamens 2–6, arranged in a disc-shaped, stalked synandrium ..... **Stephania**
5b Sepals 6; stamens 6: outer 3 free, inner 3 with connate filaments ..... **Rhigiocarya**
3b Leaves not peltate:
6a Inner sepals connate:
7a Stamens 6–9, united only at the base ..... **Synclisia**
7b Stamens 20–30, united in an elongated synandrium ..... **Albertisia**
6b Inner sepals free:
8a Petals 0:
9a Stamens free; inflorescences not elongated ..... **Triclisia**
9b Stamens united into a subglobose synandrium; inflorescences elongated ..... **Dioscoreophyllum**
8b Petals 3–6, sometimes minute:
10a Stamens 9–18, united into a conical synandrium; inflorescences of corymbose panicles or cymules, densely flowered ..... **Anisocycla**
10b Stamens 6–9, free or united:
11a Petals ± united into a cup; stamens united into a flattened stipitate synandrium; anthers opening by a transverse slit ..... **Cissampelos**
11b Petals not united into a cup:
12a Inner sepals valvate:
13a Petals minute to absent; sepals hairy ..... **Triclisia**
13b Petals developed; sepals glabrous or hairy:
14a Sepals glabrous or nearly so; inflorescence a panicle of cymules; flowers oblong ..... **Tiliacora**
14b Sepals hairy; inflorescence a fascicle of solitary flowers or of long-pedunculate, 2- or 3-flowered congested cymules; flowers subglobose ..... **Syrrheonema**
12b Inner sepals imbricate:
15a Anthers opening by a transverse or a semicircular slit:
16a Anthers opening by a semicircular slit; flowers in elongate, very slender panicles up to 0.6 m long ..... **Kolobopetalum**
16b Anthers opening by a transverse slit:
17a Stamens 3 with filaments fused almost to the apex, anther connectives triangular ..... **Dialytheca**
17b Stamens 6 or 9 with filaments free or partly fused:
18a Inflorescences in short cymules of axillary flowers; leaves short, generally entire, not strigose ..... **Cocculus**
18b Inflorescences in long panicles of sessile flowers:
19a Leaves deeply lobed, strigose ..... **Jateorhiza**
19b Leaves entire, glabrous ..... **Leptoterantha**
15b Anthers opening by a longitudinal slit:
20a Leaves nearly rounded or subangular, densely hairy especially when young; petals with a rib on the inner side ..... **Chasmanthera**
20b Leaves entire, not angular, glabrous; petals without a rib ..... **Tinospora**

Key to genera (female plants)

(*Dialytheca* not included: female plants unknown)

1a Small trees, shrubs or subshrubs, sometimes scandent:
2a Spiny subshrubs; carpel 1 ..... **Antizoma**
2b Unarmed small trees or shrubs; carpels 3 ..... **Penianthus**
1b Lianas:
3a Leaves peltate or subpeltate; carpel 1:
4a Bracts conspicuous, enlarged in fruit; petals 1, or if more, then united into a cup ..... **Cissampelos**
4b Bracts minute, not enlarged in fruit; petals 2–6, free ..... **Stephania**

3b Leaves not peltate:
5a Sepals 1, rarely 2; petals 1, rarely 2 or 3; bracts enlarged in fruit ..... **Cissampelos**
5b Sepals 3–40:
6a Inner sepals fused into a tube; carpels 4–20:
7a Staminodes 6; carpels 4–12, hairy; condyle absent ..... **Albertisia**
7b Staminodes 0; carpels 15–20; condyle present ..... **Synclisia**
6b Inner sepals free:
8a Sepals many (9–40):
9a Staminodes 0 or reduced; carpels 6–40:
10a Petals minute or absent; sepals hairy; exocarp velvety or sparsely puberulous ..... **Triclisia**
10b Petals developed; sepals glabrous or nearly so; exocarp glabrescent, smooth or rugose ..... **Tiliacora**
9b Staminodes 3 or 6; carpels 3–6:
11a Petals 3; staminodes 3 ..... **Anisocycla**
11b Petals 6; staminodes 6 ..... **Syrrheonema**
8b Sepals few (up to 6):
12a Flowers solitary or in fasciculate cymules; carpels 3; leaves up to 30 x 15 mm ..... **Cocculus**
12b Flowers many in ± elongated, usually compound inflorescences:
13a Petals 0; staminodes 0; carpels 3–6; leaves entire to 3–7-lobed ..... **Dioscoreophyllum**
13b Petals 6, rarely 3; staminodes 6, rarely 0; carpels 3:
14a Leaves palmately 3–5(7)-lobed ..... **Jateorhiza**
14b Leaves ± entire, sometimes with palmate venation:
15a Leaves with palmate venation, distinctly cordate at the base ..... **Chasmanthera**
15b Leaves with pinnate venation, not distinctly cordate at the base:
16a Flowers in panicles:
17a Staminodes 3; endocarp echinate ..... **Kolobopetalum**
17b Staminodes 6; endocarp glabrous ..... **Leptoterantha**
16b Flowers in racemes:
18a Staminodes 6; endocarp echinate ..... **Rhigiocarya**
18b Staminodes 0; endocarp often ± verrucose or tuberculate ..... **Tinospora**

Albertisia Becc.

Kessler: 408 (1993).

Epinetrum Hiern: 21 (1896); Exell & Mendonça: 37 (1937/1951); Troupin: 151 (1960); Troupin & Gonçalves: 3 (1973).

Sthn trop. Afr. 4, Angola, Zambia, Mozambique, and sthn Afr.

Anisocycla Baill.

Baillon: t. 49a (1887); Troupin: 153 (1960); Troupin & Gonçalves: 5 (1973); Kessler: 409 (1993).

Lianes with yellowish hairs. **Leaves** simple, elliptic or ovate-elliptic, discolorous. **Male inflorescences** of 4–6-flowered corymbs. **Male flowers** sessile or shortly pedicellate; sepals 9–24, pubescent to hairy on outside, 3–12 outer ones bract-like, sublinear to subovate, 3–6 median ones subspathulate or similar to outer ones, inner ones ovate-elliptic, much larger than others; petals 3–6, arising at base of androecium, small and glabrous; stamens 9–18 with filaments connate into a synandrium, anthers subsessile, thecae with transverse dehiscence. **Female inflorescences** similar to male. **Female flowers**: petals 3, similar to those of male flowers; staminodes 3 or 0; carpels 3–6, subovoid; ovary pubescent; style cylindric and glabrous. **Drupe** ovoid or subglobular, endocarp woody. **Seeds** without endosperm.

Species 6, 3 in Madagascar, 3 in trop. Africa; sthn trop. Afr. 1: *Anisocycla blepharosepala* Diels, known only from Zimbabwe and Mozambique.

Antizoma Miers

Exell & Mendonça: 358 (1937/1951); Lebrun & Stork: 98 (2003).

Sthn trop. Afr. 1: *Antizoma angolensis* Exell & Mendonça, Angola, and sthn Afr.

Chasmanthera Hochst.

Hochstetter: 21 (1844); Exell & Mendonça: 357 (1951); Troupin: 157 (1960); Kessler: 414 (1993).

Lianes with verrucose bark. **Leaves** simple, with long petioles, suborbicular, cordate at base, densely hairy; nerves palmate. **Male inflorescences** of false racemes of 3–5-flowered cymules; bracts filiform, persistent. **Male flowers** with 6–9 sepals, 3 outer bract-like and hairy, 3–6 inner larger, membranous to papyraceous, concave, pubescent outside; petals 6, fleshy, ribbed inside; stamens 6, erect, with long connate filaments; anther thecae with longitudinal dehiscence. **Female inflorescences** of pendulous racemes. **Female flowers** with sepals and petals similar to those of male, sometimes larger; staminodes 6, small, elongate; carpels 3, subovoid, narrowed into a short style; stigma membranous, recurved, longitudinally cleft. **Drupelets** 3, ellipsoid and unequal-sided, apiculate; exocarp coriaceous; endocarp with a dorsal, median, slightly tuberculate ridge, 3 apical teeth, and 2 ventral narrow marginal wings. **Seeds** with ruminate endosperm.

Species 2, trop. Africa; sthn trop. Afr. 2: Angola, Zambia.

Cissampelos L.

Exell & Mendonça: 43 (1937/1951); Troupin: 165 (1960); White: 48 (1962); Exell: 139 (1970); Troupin & Gonçalves: 18 (1973); Rhodes: 415 (1975); White *et al.*: 375 (2001).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cocculus DC.

Exell & Mendonça: 41, 358 (1937/1951); Troupin: 163 (1960); Troupin & Gonçalves: 16 (1973).

Sthn trop. Afr. 1: *Cocculus hirsutus* (L.) Diels, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dialytheca Exell & Mendonça

Exell & Mendonça in Exell: 8 (1935); Exell & Mendonça: 40 (1937/1951); Kessler: 412 (1993).

Climbers with simple leaves. **Flowers** in pseudoracemes. **Male flowers**: sepals 6, inner 3 much larger than outer 3; stamens 3, filaments connate, anthers with transverse dehiscence. **Female plants** unknown.

Monotypic: *Dialytheca gossweileri* Exell & Mendonça, Angola.

Dioscoreophyllum Engl.

Engler: 181 (1895); Exell & Mendonça: 40 (1937/1951); Troupin: 157 (1960); Troupin & Gonçalves: 11 (1973); Dowsett-Lemaire & White: 80 (1990); Kessler: 414 (1993); White *et al.*: 376 (2001); Mapaura & Timberlake: 166 (2002).

Herbaceous twiners; branchlets ± slender, sparsely pubescent or hirsute. **Leaves** simple, ovate-triangular with sagittate-cordate base, entire or 3–7-lobed, with long petioles. **Male inflorescences** of axillary, long-pedunculate racemes. **Male flowers** with 6–8 sepals in 2 whorls; petals 0; stamens 3–6, fused into a cylindric or subglobular, sometimes flattened, sessile or stipitate synandrium; anther thecae oblong, parallel, dehiscing longitudinally. **Female inflorescences** similar to male. **Female flowers** with 6 sepals; petals 0; carpels 3–6, with thickened, recurved stigmas. **Drupelets** subovoid, topped by remains of style and stigma; exocarp smooth and sometimes shining; endocarp crustaceous, verrucose or covered on upper side with short prickles much enlarged at base. **Seeds** with thick fleshy endosperm.

Species 3, trop. Africa; sthn trop. Afr. 3: Angola, Zimbabwe, Malawi, Mozambique.

Jateorhiza Miers

Miers: 212 (1849); Exell: 14 (1926) as *Jatrorrhiza*; Exell & Mendonça: 40 (1937/1951); Troupin: 156 (1960); Troupin & Gonçalves: 10 (1973); Kessler: 413 (1993); White *et al.*: 376 (2001); Phiri (Unpublished).

Chasmanthera not of Hochst.; Exell & Mendonça: 38 (1937/1951).

Somewhat woody lianes with dense indumentum and tuberous rootstock. **Leaves** palmately 3–5(7)-lobed, strigose on both surfaces; petiole long. **Male inflorescences** of elongate axillary panicles, lateral axes bearing 3–7-flowered clusters. **Male flowers** with 6 sepals, 3 outer ones elongate to elliptic, 3 inner ones obovate; petals 6, somewhat concave, mostly abruptly bent inwards at apex and with margins incurved and enveloping androecium; stamens 6, free or connate; anthers introrse, globular; thecae with transverse dehiscence. **Female inflorescences** of axillary racemes. **Female flowers** with sepals and petals ± similar to those of male; staminodes 6, tongue-shaped. **Carpels** 3, subovoid; styles small, recurved; stigma broad, produced into 2- or 3-cleft lamellae. **Drupelets** ovoid or subovoid; exocarp strigose-hispid or setulose; endocarp ovoid, flattened, ventral side ± smooth, dorsal side clothed with many fibrillose hairs. **Seeds** with fleshy, ruminate endosperm.

Species 2, trop. Africa; sthn trop. Afr. 2: Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Kolobopetalum Engl.

Engler: 410 (1899); Exell & Mendonça: 39 (1937/1951); Kessler: 414 (1993).

High-climbing shrubs with long internodes. **Leaves** simple, oblong, auriculate at base; petiole of older leaves often twining. **Inflorescences** ample panicles. **Male flowers**: sepals 6, outer 3 shorter than inner 3; petals 6; stamens (3)6, free or ± connate, anthers with a semicircular dehiscence. **Female flowers**: sepals and petals as in male; staminodes 3; carpels 3. **Drupes** ellipsoid; endocarp crustaceous, densely echinate; condyle scutelliform. **Seeds**: endosperm weakly ruminate at ventral side; embryo subreniform, cotyledons oblong-lanceolate, divaricate.

Species 4, trop. Africa; sthn trop. Afr. 2: Angola.

Leptoterantha Louis ex Troupin

Troupin: 426 (1949); Exell & Mendonça: 357 (1937/1951); Kessler: 414 (1993).

Climbing shrubs. **Leaves** simple, elliptic to oblong-elliptic, base cuneate, entire, petiolate. **Inflorescence**: axillary panicles. **Male flowers**: sepals 6, inner 3 longer than outer 3; petals 6, outer 3 longer than inner 3; stamens 6, filaments connate, anthers with transverse dehiscence. **Female flowers**: sepals and petals as in male; staminodes 6; carpels 3. **Drupe** ellipsoid; endocarp glabrous; condyle scutelliform. **Seeds**: endosperm weakly ruminate at ventral side; cotyledons foliaceous.

Monotypic genus: *Leptoterantha mayumbensis* (Exell) Troupin, W trop. Africa; sthn trop. Afr.: Angola.

Penianthus Miers

Miers: 124 (1864a); Exell & Mendonça: 37 (1937/1951); Dekker: 41 (1983); Kessler: 408 (1993).

Shrubs or small trees, evergreen, usually 1-stemmed and sparsely branched, glabrous in all vegetative parts. **Leaves** simple, entire, usually coriaceous; petiole swollen at both ends. **Inflorescence** a few- to many-flowered globose head or umbel. **Male flowers**: tepals 12–18, in whorls of 3; stamens (3–)6(–8), free or sometimes 2 stamens completely connate lengthwise, anthers with apical dehiscence. **Female flowers**: tepals 12(–14); staminodes 6 or 0; carpels 3. **Drupe** oblong to elliptic, smooth; endocarp chartaceous; condyle present. **Seeds**: endosperm absent; embryo straight, cotyledons thick, adpressed. $x = 13, 26$.

Species 4, W and C Africa; sthn trop. Afr. 1: *Peniantlus longifolius* Miers (=*P. gossweileri* Exell), Angola (Cabinda).

Rhigiocarya Miers

Miers: 101 (1864b); Exell & Mendonça: 39 (1937/1951); Keay: 72 (1954); Kessler: 413 (1993).

Glabrous lianes; branchlets slender with long internodes. **Leaves** simple, broadly ovate, cordate at base, peltate. **Inflorescence** cymes. **Male flowers**: sepals 6, outer 3 shorter than inner 3; petals 6; stamens 6, outer 3 free, introrse, inner 3 with connate filaments, extrorse, anthers with longitudinal dehiscence. **Female flowers**: sepals and petals as in male; staminodes 0; carpels 3. **Drupe** ovoid to ellipsoid; endocarp bony, echinate; condyle forming a cavity. **Seeds**: endosperm ruminate; embryo subreniform, cotyledons foliaceous, divaricate. $x = 12$.

Species 2, tropical equatorial Africa; sthn trop. Afr. 1: *Rhigiocarya racemifera* Miers, Angola (Cabinda).

Stephania Lour.

Exell & Mendonça: 41, 358 (1937/1951); Troupin: 169 (1960); White: 48 (1962); Troupin & Gonçalves: 24 (1973); White *et al.*: 376 (2001); Lebrun & Stork: 102 (2003).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Synclisia Benth.

Bentham: 36 (1862); Exell & Mendonça: 36 (1937/1951); Keay: 68 (1954); Kessler: 409 (1993).

Lianes with slender stems. **Leaves** simple, clothed with long, stiff, spreading hairs; petiole slender. **Inflorescence**: flowers axillary, solitary or paired. **Male flowers**: sepals 9, inner 3 connate into a pseudocorolla, outer 6 much smaller than inner ones; petals 6; stamens 6–9, connate at base, outer 3(6) much shorter than inner ones, anthers with suboblique dehiscence. **Female flowers**: sepals and petals as in male; staminodes 0; carpels 15–20. **Drupe** obovoid to ellipsoid; endocarp crustaceous, velutinous; condyle lamelliform. **Seeds**: endosperm absent; embryo curved, cotyledons thick, appressed, unequal.

Monotypic: *Synclisia scabrida* Miers, C Africa; sthn trop. Afr.: Angola.

Syrrheonema Miers

Miers: 124 (1864a); Exell & Mendonça: 37 (1937/1951) as *Syrrhonema*; Kessler: 409 (1993).

Climbing shrubs; branches pilose. **Leaves** simple. **Inflorescence**: dense fascicles or heads. **Male flowers**: sepals 9–18, outer ones smaller than inner ones; petals 3; stamens 3–6, completely connate, introrse, anthers with transverse dehiscence. **Female flowers**: sepals as in male; petals 6; staminodes 6; carpels 3–5. **Drupe** globose; endocarp crustaceous, rugose; condyle septiform. **Seeds**: endosperm absent; embryo curved, cotyledons thick, appressed.

Species 3, C Africa; sthn trop. Afr. 1: *Syrrheonema welwitschii* (Hiern) Diels, Angola.

Tiliacora Colebr.

Colebrooke: 53, 67 (1821) name conserved; Exell & Mendonça: 33 (1937/1951); Troupin: 153 (1960); White: 50 (1962); Troupin & Gonçalves: 6 (1973); Kessler: 411 (1993); White *et al.*: 378 (2001); Lebrun & Stork: 104 (2003).

Species 22, Old World tropics, 19 in Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tinospora Miers

Troupin: 159 (1960); White: 50 (1962); Troupin & Gonçalves: 13 (1973); White *et al.*: 378 (2001); Van Jaarsveld: 313 (2002); Lebrun & Stork: 108 (2003).

Desmonema Miers; Exell & Mendonça: 38, 357 (1937/1951). *Hyalosepalum* Troupin; Exell & Mendonça: 357 (1937/1951).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Triclisia Benth.

Bentham: 39 (1862); Exell & Mendonça: 35 (1937/1951); Troupin: 155 (1960); Troupin & Gonçalves: 8 (1973); Dowsett-Lemaire: 80 (1990); Kessler: 410 (1993); Lebrun & Stork: 108 (2003).

Robust, twining lianes; young branches densely rusty-tomentellous. **Leaves** simple; lamina entire, rarely serrate. **Male inflorescences** of corymb-like cymules or of small, many-flowered panicles. **Male flowers** with 9–18 sepals, all densely pubescent outside, outer ones bract-like, inner ones suborbicular and somewhat united; petals 6, very small or absent, glabrous and somewhat fleshy; stamens 3–6, free; anther thecae with obliquely longitudinal dehiscence; gynoecium replaced by a tuft of rusty hairs. **Female inflorescences** similar to male. **Female flowers** with sepals similar to those of male; petals 3–6 or 0; staminodes reduced; carpels 6–40, pubescent, narrowed into a cylindrical style. **Drupelets** obovoid, flattened, stipitate; exocarp usually velvety, sparsely puberulous; endocarp rugose and fibrous-hairy. **Seeds** without endosperm.

Species 10, Madagascar and trop. Africa; sthn trop. Afr. 4, Angola, Mozambique.

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Menyanthaceae
(Asteridae—Asterales)
(Euasterids II—Asterales)

Bredenkamp, C.L. in Leistner: 359 (2000).

Sthn trop. Afr.: genus 1, species 7.

Nymphoides Ség.

Raynal: 405 (1974); Mackinder: 51 (1990); Whitehouse: 1 (1996).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Mesembryanthemaceae
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales; under Aizoaceae)

Chesselet, P., Smith, G.F., Burgoyne, P.M., Klak, C., Hammer, S.A., Hartmann, H.E.K., Kurzweil, H., van Jaarsveld, E.J., van Wyk, B.-E. & Leistner, O.A. in Leistner: 360 (2000). General family reference: Chesselet *et al.*: 295 (2002).

Sthn trop. Afr.: genera 4, species ± 8.

*Aptenia N.E.Br.

Gonçalves: 549 (1978); Gonçalves: 1 (1979).

Sthn trop. Afr. 1: **Aptenia cordifolia* (L.f.) N.E.Br., native to sthn Afr. but cultivated worldwide and recorded as naturalised in Mozambique.

Delosperma N.E.Br. emend. Lavis

Gonçalves: 551 (1978); Gonçalves: 4 (1979); Hartmann: 184 (2002); Mapaura & Timberlake: 166 (2002).

Sthn trop. Afr. 3, Zimbabwe, Mozambique, and sthn Afr.

Mesembryanthemum L. emend. L.Bolus

Gerbaulet: 143 (2002).

Opophytum N.E.Br.; Gonçalves: 331 (1970).

Sthn trop. Afr. 1 or 2: *Mesembryanthemum cryptanthum* Hook.f. (=*Opophytum dactylinum* (Welw. ex Oliv.) N.E.Br.), and probably *M. crystallinum* L., Angola, and sthn Afr.

Psilocaulon N.E.Br.

Gonçalves: 332 (1970); Klak & Linder: 301 (1998); Klak & Gerbaulet: 230 (2002).

Sthn trop. Afr. 2, Angola, and sthn Afr.

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Molluginaceae
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Dreyer, L.L. & Jordaan, M. in Leistner: 410 (2000).

Sthn trop. Afr.: genera 7, species 22.

Corbichonia Scop.
Gonçalves: 313 (1970); Gonçalves: 533 (1978); Gonçalves: 15 (1979).

Sthn trop. Afr. 1: *Corbichonia decumbens* (Forssk.) Exell, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Glinus L.
Gonçalves: 315 (1970); Gonçalves: 537 (1978); Gonçalves: 17 (1979).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hypertelis E.Mey. ex Fenzl
Gonçalves: 321 (1970); Gonçalves: 546 (1978); Gonçalves: 26 (1979).

Sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique, and sthn Afr.

Limeum L.
Gonçalves: 307 (1970) under Aizoaceae; Gonçalves: 525 (1978); Gonçalves: 6 (1979); Lisowski: 476 (1987).

Semonvillea J.Gay; Exell: 198 (1929).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Mollugo L.
Gonçalves: 318 (1970); Gonçalves: 541 (1978); Gonçalves: 23 (1979).

Sthn trop. Afr 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pharnaceum L.
Gonçalves: 544 (1978).

Sthn trop. Afr. 1: *Pharnaceum brevicaule* (DC.) Bartl., Zimbabwe, and sthn Afr.

Psammotropha Eckl. & Zeyh.
Gonçalves: 314 (1970); Gonçalves: 535 (1978); Gonçalves: 16 (1979).

Sthn trop. Afr. 1: *Psammotropha myriantha* Sond., Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

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Monimiaceae
(Magnoliidae—Magnoliales)
(Magnoliids—Laurales)

Jordaan, M. in Leistner: 414 (2000).

Sthn trop. Afr.: genus 1, species 1.

Xymalos Baill.
Stannard: 42 (1997); White *et al.*: 379 (2001); Coates Palgrave: 212 (2002); Phiri (Unpublished).

Monotypic genus: *Xymalos monospora* (Harv.) Baill., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Montiniaceae

(Rosidae—Rosales)
(Euasterids I—Solanales)

Jordaan, M. in Leistner: 414 (2000).

Sthn trop. Afr.: genera 2, species 2.

Key to genera

[after Mendes (1978)]

Leaves alternate; male flowers usually 4-merous, bracteate; capsule ellipsoid, smooth, loculicidal; seeds with a broad papery wing ..... **Montinia**
Leaves opposite or subopposite; male flowers usually 3-merous, ebracteate; capsule flask-shaped, tuberculate and spiny, indehiscent; seeds wingless ..... **Grevea**

Grevea Baill.

Baillon: 420 (1884); Milne-Redhead: t. 3541–3544 (1955); Mendes: 24 (1970); Mendes: 54 (1978); Mendes: 2 (1981); Izidine & Bandeira: 51 (2002).

Small dioecious, deciduous trees or shrubs. **Leaves** simple, opposite or subopposite, penninerved, petiolate; stipules 0. **Male flowers** in terminal or axillary, few-flowered inflorescences; bracts very small, obsolete or absent; calyx: tube ± cupular, truncate, subentire or shallowly 3-lobed; petals 3, arising below margin of disc, imbricate; stamens (?2)3, alternipetalous, arising with petals, with introrse anthers dehiscing by longitudinal slits; disc fleshy, cupular, usually elevated in centre into a vestigial ovary. **Female flowers** solitary, terminal; calyx tube elongated, smooth and longitudinally striate or tuberculate to echinulate, with usually 4 inconspicuous lobes; petals usually 4; disc epigynous; staminodes present; ovary bicarpellary; style columnar, short and thick; stigmas 2-lobed; ovules 2-seriate on each placenta. **Fruit** indehiscent, crowned by persistent style. **Seeds** subellipsoid to subglobose; endosperm abundant, horny.

Species 2, E trop. Africa and Madagascar; sthn trop. Afr. 1: *Grevea eggelingii* Milne-Redh., Mozambique.

Montinia Thunb.

Milne-Redhead: t. 3541–3544 (1955); Mendes: 54 (1978); Decraene *et al.*: 1408 (2000); Coates Palgrave: 240 (2002).

Monotypic genus: *Montinia caryophyllacea* Thunb., Angola, and sthn Afr.

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Moraceae

(Hamamelidae—Urticales)
(Eurosids I—Rosales)

Jordaan, M. in Leistner: 415 (2000).

Sthn trop. Afr.: genera 10, species 69.

Key to genera

[adapted from Rohwer (1993)]

1a Inflorescences urceolate ('figs'), enclosing the flowers ..... **Ficus**
1b Inflorescences not urceolate:
  2a Plants with curved or straight spines; bracts and/or tepals usually with immersed glands accumulating a yellow dye ..... **Maclura**
  2b Plants unarmed; bracts and tepals without yellow glands:
    3a Inflorescences bisexual:
      4a Filaments straight in bud:
        5a Stipules connate ..... **Trilepisium**
        5b Stipules free ..... **Treculia**
      4b Filaments inflexed in bud:
        6a Inflorescence axis not expanded; filaments springing back elastically at anthesis ..... **Streblus**
        6b Inflorescence axis expanded into a (mostly) discoid or variously shaped structure bearing many flowers; filaments straightening gradually at anthesis:
          7a Interfloral bract present, peltate ..... **Bosqueiopsis**

7b Interfloral bracts 0 ..... **Dorstenia**
3b Inflorescences unisexual:
8a Inflorescences staminate:
9a Filaments straight to slightly curved in bud ..... **Antiaris**
9b Filaments inflexed in bud:
10a Stamens 1 or 2 per flower, straightening gradually at anthesis ..... **Bosqueiopsis**
10b Stamens 3–5 per flower, with explosive pollen release:
11a Flowers in dense longitudinal rows, alternating with rows of bracts ..... **Milicia**
11b Flowers differently arranged ..... **Streblus**
8b Inflorescences pistillate:
12a Inflorescences with an involucre of several (often many) imbricate bracts:
13a Stipules amplexicaul ..... **Treculia**
13b Stipules not fully amplexicaul ..... **Antiaris**
12b Inflorescences without bracts at the base:
14a Shoot apices deciduous ..... **Morus**
14b Shoot apices persistent ..... **Streblus**

Antiaris Lesch.

Leschenault de la Tour: 478 (1810), conserved name; Berg: 10 (1989); Berg: 24 (1991); Rohwer: 450 (1993); Bingham & Smith: 142 (2002).

Trees, monoecious or dioecious; lateral branches self-pruning. **Leaves** distichous on lateral branches, pinnately veined; stipules semi-amplexicaul, free. **Inflorescences** on minute spurs, in leaf axils or just below leaves, unisexual, involucrate. **Staminate inflorescences** pedunculate; flowers many; tepals 2–7, free; stamens 2–4, straight in bud; pistillode 0. **Pistillate inflorescences** sessile or pedunculate, uniflorous; perianth partly adnate to receptacle, 4-lobed; ovary adnate to perianth, stigmas 2, ligulate, equal. **Fruit** forming a drupaceous whole together with enlarged fleshy, orange to scarlet-coloured receptacle. **Seed** large, without endosperm; cotyledons thick, equal.

Monotypic, widespread in the tropical Old World: *Antiaris toxicaria* Lesch. subsp. *welwitschii* (Engl.) C.C.Berg; sthn trop. Afr.: Angola, Zambia.

Bosqueiopsis De Wild & T.Durand

De Wildeman & Durand: 839 (1901); Berg: 293 (1977); Berg: 15 (1989); Berg: 26 (1991); Rohwer: 451 (1993).

Trees or shrubs, monoecious or (?)sometimes androdioecious. **Leaves** distichous, pinnately veined to subtriplinerved; stipules fully amplexicaul, free. **Inflorescences** in leaf axils or just below leaves, bisexual or staminate, discoid or subglobose to turbinate-capitate; bracts interfloral, peltate, marginal bracts often basally attached. **Staminate flowers** several to many; tepals 3 or 4, connate; stamens (1)2, inflexed in bud; pistillode present. **Pistillate flower** 1, central, partly adnate to receptacle; perianth 4-lobed; ovary adnate to perianth; stigmas 2, band-shaped, equal. **Fruit** forming a drupaceous whole with an enlarged, fleshy, orange to yellow receptacle, crowned with remnants of staminate flowers and bracts. **Seed** large, without endosperm; cotyledons thick, unequal.

Monotypic, trop. Africa: *Bosqueiopsis gilletii* De Wild. & T.Durand, Mozambique.

Dorstenia L.

Linnaeus: 121 (1753); Hiern: 1025 (1900); Berg *et al.*: 24 (1985); Hijman: 20 (1989); Hijman: 361 (1990); Berg: 30 (1991); Percy-Lancaster & Richards: 75 (1992); Rohwer: 452 (1993); Hijman & Berg: 314 (2002); Izidine & Bandeira: 51 (2002) .

Herbs, subshrubs or shrubs often (somewhat) succulent, often with rhizomes or tuberous subterranean parts; monoecious. **Leaves** simple to deeply lobed, pinnately veined; stipules free, lateral. **Inflorescences** bisexual, pedunculate, axillary, capitate, shape of head very variable: discoid to stellate or narrowly elongate, usually with marginal bracts or appendices of variable shape and size; interfloral bracts absent. **Staminate flowers** many, basally connate; tepals (1)2 or 3(4), free or basally connate; stamens 2 or 3, inflexed in bud; pistillode usually absent. **Pistillate flowers** (in central part of inflorescence) 1–many; connate, often immersed; perianth tubular; ovary free, stigmas 2, equal or unequal. **Fruit** a dehiscent drupe, embedded in the infructescence head.

Species ± 105, ± 60 African; sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Ficus L.

Gossweiler & Mendonça: 76 etc. (1939); White: 26 (1962); Berg: 43 (1989); Berg: 39 (1991); Pannell: 380 (2001); White & Dowsett-Lemaire: 383 (2001); White *et al.*: 380 (2001); Bingham & Smith: 142 (2002); Coates Palgrave: 132 (2002); Mapaura & Timberlake: 166 (2002); Burrows & Burrows: 1 (2003).

Sthn trop. Afr. 46, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Maclura Nutt.

Berg: 18 (1991); Coates Palgrave: 131 (2002).

Cardiogyne Bureau; Burtt Davy *et al.*: 67 (1958); White: 26 (1962). *Chlorophora* Gaudich. in part; Burtt Davy *et al.*: 67 (1958).

Sthn trop. Afr. 1: *Maclura africana* (Bureau) Corner, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Milicia Sim

Sim: 97 (1909); Berg: 226 (1982); Berg: 4 (1989); Berg: 16 (1991); Rohwer: 446 (1993); White *et al.*: 393 (2001); Bingham & Smith: 142 (2002); Coates Palgrave: 130 (2002); Mapaura & Timberlake: 166 (2002); Msekandiana & Mlangeni: 36 (2002).

Chlorophora Gaudich. in part.

Dioecious trees. **Leaves** distichous, pinnately veined; stipules semi-amplexicaul, free. **Inflorescences** in leaf axils, spicate,

bracteate. **Staminate flowers**: tepals 4, basally connate; stamens 4, inflexed in bud; pistillode present. **Pistillate flowers** many; tepals 4, basally connate; ovary free, stigmas 2, filiform, markedly unequal in length. **Fruiting perianth** enlarged, ± fleshy, greenish. **Fruit** a syncarp; perianth and exocarp fleshy. **Seed** small; endosperm present; cotyledons thin, equal, plane.

Species 2, trop. Africa; sthn trop. Afr 1 : *Milicia excelsa* (Welw.) C.C.Berg, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Morus L.

Berg: 14 (1991); White *et al.*: 395 (2001); Coates Palgrave: 129 (2002); Mapaura & Timberlake: 166 (2002).

Sthn trop. Afr. 1: *Morus mesozygia* Stapf, Angola, Zambia, Malawi, Mozambique, and sthn Afr. **Morus australis* Poir. (=*M. alba* of various authors) from Asia, has become naturalised, at least in sthn Afr. [(Coates Palgrave: 129 (2002)].

Streblus Lour.

Loureiro: 599, 614 (1790); Berg: 21 (1991); Rohwer: 446 (1993); Coates Palgrave: 131 (2002); Mapaura & Timberlake: 166 (2002).

Sloetiopsis Engl.; Berg: 363 (1977); Berg: 8 (1989).

Shrubs or small trees, dioecious or sometimes monoecious. **Leaves** distichous, pinnately veined; stipules semi-amplexicaul, free. **Inflorescences** in leaf axils, bracteate. **Staminate inflorescences** spicate; tepals 4, basally connate; stamens 4, inflexed in bud, pistillode present. **Pistillate inflorescences** uniflorous; tepals 4, free; ovary free; stigmas 2, filiform, subequal in length. **Fruiting perianth** enlarged, hardly fleshy, green. **Fruit** a free, dehiscent drupe, white fleshy exocarp pushing out black endocarp body (pyrene). **Seed** large; endosperm absent; cotyledons thick, equal.

Species ± 25, Old World tropics, 2 in Madagascar, 1 in Africa: *Streblus usambarensis* (Engl.) C.C.Berg; sthn trop. Afr.: Mozambique.

Treculia Decne. ex Trécul

Trécul: 108 (1847); Berg: 378 (1977); Berg: 8 (1989); Berg: 21 (1991); Rohwer: 447 (1993); White *et al.*: 398 (2001).

Trees, dioecious or sometimes monoecious. **Leaves** almost distichous, pinnately veined; stipules fully amplexicaul, free. **Inflorescences** unisexual, sometimes bisexual, borne in leaf axils and/or (especially pistillate ones) on older wood down to trunk, globose to obovoid-capitate, with a thick rachis and many peltate, long-stipitate bracts. **Staminate flowers**: perianth 2–4(5)-lobed; stamens 2–4, straight in bud; pistillode usually absent. **Pistillate flowers** without a perianth; stigmas 2, filiform, equal. **Fruit** a syncarp, covered with indurate tips of interfloral bracts. **Seed** large, with remnants of endosperm; cotyledons unequal, curved, one thick, the other thin.

Species 3, trop. Africa, one extending to Madagascar; sthn trop. Afr. 2: Angola, Zambia, Malawi, Mozambique.

Trilepisium Thouars

Berg: 297 (1977); Berg: 17 (1989); Berg: 28 (1991); Rohwer: 451 (1993); White *et al.*: 398 (2001); Coates Palgrave: 132 (2002).

Bosqueia Thouars ex Baill.; Burtt Davy *et al.*: 67 (1958) as *Bosquiea.*

Monotypic: *Trilepisium madagascariense* DC., trop. Africa, Madagascar and Seychelles; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Moringaceae
(Dilleniidae—Capparidales)
(Eurosids II—Brassicales)

Jordaan, M. in Leistner: 417 (2000).

Sthn trop. Afr.: genus 1, species 1.

Moringa Adans.

Exell & Mendonça: 134 (1954/1956); Mendes: 51 (1961); White: 66 (1962); Verdcourt: 1 (1985); Verdcourt: 1 (1986); Olson & Carlquist: 315 (2001); Coates Palgrave: 237 (2002); Olson: 55 (2002); Olson: 49 (2003).

Moringa ovalifolia Dinter & A.Berger is endemic in SW Angola and Namibia; **M. oleifera* Lam. is widely cultivated, e.g. in Zambia.

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Myricaceae
(Hamamelidae—Juglandales)
(Eurosids I—Fagales)

Jordaan, M. in Leistner: 418 (2000).

Sthn trop. Afr.: genus 1, species 3.

Morella Lour.

Loureiro: 548 (1790); Wilbur: 93 (1994); Killick *et al.*: 993 (1998); Polhill & Verdcourt: 2 (2000); Coates Palgrave: 122 (2002).

Myrica L.: 1024 (1753); Hutchinson: 307 (1917) in part; Burtt Davy *et al.*: 68 (1958); White: 22 (1962); Killick: 5 (1969); Polhill: 261 (1989); Kubitzki: 456 (1993) in part; White: 177 (1993) in part; White *et al.*: 401 (2001).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

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Myristicaceae
(Magnoliidae—Magnoliales)
(Magnoliids—Magnoliales)

Evergreen trees or lianes, dioecious or monoecious, often aromatic; sap coloured; indumentum of stellate-branching, shortly stalked T-shaped or uniseriate hairs. **Leaves** alternate, simple, entire, often gland-dotted; stipules 0. **Inflorescences** paniculate

or capitate; bracts often present, usually deciduous; bracteoles mostly absent. **Flowers** unisexual, regular, small; perianth saucer- or funnel-shaped, campanulate or urceolate; lobes valvate. **Male flowers**: perianth 3- or 4-lobed; stamens with filaments fused into a long, exserted column; anthers 2–6, 2-thecous, adnate to column about apical part, laterally connate, extrorse, opening by longitudinal slits; rudimentary gynoecium 0. **Female flowers**: perianth 3- or 4-lobed; gynoecium 1-carpellate; ovary superior, 1-locular, usually sessile; ovule 1, ± basal, bitegmic, usually anatropous; style short or absent; stigmas 2, ± joined. **Fruit** a drupe, mostly dehiscing into 2 valves and therefore also referred to as a monocarpellate capsule; pericarp fleshy, leathery or cartilaginous. **Seed** partially or completely enveloped by an often brightly coloured aril ± lobed at apex; testa usually in 3 layers: outer membranous or fleshy, middle one woody, inner one membranous, usually intruding into folds of endosperm; endosperm abundant, entire or ruminate, very oily; embryo very small, with basal, suberect, spreading or connate cotyledons.

Genera 19, species ± 400, pantropical, 5 genera reported for Africa; sthn trop. Afr. genera 2, species 2, Angola, Zambia. **Myristica fragrans* Houtt., the Nutmeg tree, originally native of the Moluccas, has sofar not been recorded as cultivated or established in the region.

Brown: 399 (1810) name conserved; Keay: 60 (1954); Fouilloy: 89 (1974); Kühn & Kubitzki: 457 (1993); Pope: 37 (1997); Verdcourt: 1 (1997).

Key to genera

Leaves with 15–60 pairs of lateral nerves, ± cordate at base; inflorescences paniculate; aril of seed very deeply laciniate ..... **Pycnanthus**
Leaves with 5–10 pairs of lateral nerves, rounded to cuneate at base; inflorescences capitate; aril of seed lobulate at apex ..... **Staudtia**

Pycnanthus Warb.

Warburg: 99 (1895); White: 56 (1962); Fouilloy: 90 (1974); Pope: 37 (1997); Verdcourt: 4 (1997).

Trees or lianes; indumentum of branching-stellate, ± erect hairs. **Leaves** mostly cordate at base, main lateral nerves pronounced, in 15–60 pairs. **Inflorescence** paniculate, divaricately branched, with flowers clustered in many dense, obovoid-globose heads at ends of inflorescence branches. **Male flowers** with 2–6 anthers. **Seed** with fleshy aril, laciniate almost to base.

Species 3 or 4, trop. Africa; sthn trop. Afr. 1: *Pycnanthus angolensis* (Welw.) Warb., Angola, Zambia.

Staudtia Warb.

Warburg: 129, 241 (1897); Fouilloy: 102 (1974); Pope: 40 (1997); Verdcourt: 7 (1997).

Trees; indumentum of shortly stalked, T-shaped, ± appressed hairs. **Leaves** rounded to broadly cuneate at base, main lateral nerves faint, in 5–10 pairs. **Inflorescence** capitate, with flowers densely clustered in subglobose, shortly pedunculate heads in leaf axils. **Male flowers** with 3 or 4 anthers. **Seed** with aril thinly fleshy; lobulate at apex.

Species 1, W Africa; sthn trop. Afr.: *Staudtia kamerunensis* Warb. var. *gabonensis* (Warb.) Fouilloy, Angola, Zambia.

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Myrothamnaceae

(Hamamelidae—Hamamelidales)
(Core Eudicots—Gunnerales)

Jordaan, M. in Leistner: 418 (2000).

Sthn trop. Afr.: genus 1, species 1.

Myrothamnus Welw.

White: 67 (1962); Mendes: 30 (1970); Mendes: 69 (1978); Puff: 1 (1978); Mendes: 2 (1981); Bywater: 1 (1984); Kubitzki: 468 (1993); Glen *et al.*: 62 (1999); Wanntorp *et al.*: 86 (2001).

Species 2: 1 from Madagascar, the other: *Myrothamnus flabellifolius* Welw. from tropical and southern Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Myrsinaceae
(Dilleniidae—Primulales)
(Asterids—Ericales)

Ngwenya, M.A. in Leistner: 419 (2000).

Sthn trop. Afr.: genera 4, species ± 8.

Identification of additional genus using the key in the above reference: **Ardisia** will key out to contrast 3b but can be distinguished from *Embelia* by its almost sessile anthers (not having filiform filaments) and the shortly united (not free) petals.

Ardisia Sw.

Swartz: 3, 48 (1788), name conserved; Taton: 517 (1979); Taton: 12 (1980). *Afrardisia* Mcz; Good: 69 (1927); De Wit: 242 (1958); Hepper: 31 (1963).

Low, soft-wooded, rhizomatous shrubs; branchlets glabrous, longitudinally striate. **Leaves** alternate, petiolate, spathulate to narrowly oblanceolate, chartaceous, glabrous, with numerous small raised dots on lower surface. **Inflorescences** axillary, 4–7-flowered pseudofascicles. **Flowers** bisexual or female; female flowers consisting only of calyx and gynoecium. **Calyx** 5, imbricate, broadly ovate to suborbicular, minutely fimbriate to erose, glandular. **Petals** 5, very shortly connate, imbricate, lanceolate, sparsely dotted, abaxially minutely puberulous. **Stamens** 5; filaments very short, flattened and fused into a short staminal tube fused to corolla tube; anthers large, narrowly lanceolate, acuminate to apiculate at apex, often with dark dots on dorsal face, longitudinally dehiscent. **Ovary** ovoid to conical, sparsely lepidote towards apex; free-central placenta with 6–8 ovules; style filiform; stigma punctiform. **Fruit** a globose, 1-seeded, indehiscent, glabrous drupe with brittle endocarp. **Seed** globose, covered with membranous rudiments of placenta.

Species 250, pantropical, mainly Asian and American; sthn trop. Afr. 1: *Ardisia mayumbensis* (R.D.Good) Taton, Angola.

Embelia Burm.f.

White: 316 (1962); Taton: 30 (1980); Kupicha: 206 (1983); Halliday: 11 (1984); White *et al.*: 406 (2001); Bingham & Smith: 142 (2002); Coates Palgrave: 867 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Myrsine L.

Taton: 49 (1980); Kupicha: 201 (1983); Halliday: 6 (1984); White *et al.*: 408 (2001); Coates Palgrave: 867 (2002).

Sthn trop. Afr. 1: *Myrsine africana* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rapanea Aubl.

Taton: 53 (1980); Kupicha: 203 (1983); Halliday: 8 (1984); White *et al.*: 408 (2001); Coates Palgrave: 868 (2002).

Sthn trop. Afr. 1: *Rapanea melanophloeos* (L.) Mez, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Myrtaceae
(Rosidae—Myrtales)
(Rosids—Myrtales)

Glen, H.F. & Victor, J.E. in Leistner: 420 (2000).

Sthn trop. Afr.: genera ?5: 2 indigenous with 15 species of which 1 is exotic; and at least 3 exotic genera of which at least 13 species have become naturalised.

*Callistemon R.Br.

White: 292 (1962); White: 204 (1978); Coates Palgrave: 840 (2002).

Cultivated; according to Coates Palgrave (2002) **Callistemon viminalis* (Salisb. ex Gaertn.) Don ex Loudon has escaped in some areas of central Zimbabwe, and sthn Afr.

*Eucalyptus L'Hér.

White: 293 (1962); White: 206 (1978); Mullin: 95 (1996); Coates Palgrave: 839 (2002).

Sthn trop. Afr.: Many species are cultivated, some occur as escapes; Coates Palgrave (2002) lists 9 species that have become naturalised in Zimbabwe.

Eugenia L.

Greves: 175 (1928); White: 301 (1962); Amshoff: 94 (1970); White: 186 (1978); Verdcourt: 41 (1999); Verdcourt: 55 (2001); White *et al.*: 409 (2001); Coates Palgrave: 825 (2002); Lebrun & Stork: 516 (2003).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Psidium L.

White: 303 (1962); Amshoff: 93 (1970); White: 185 (1978); Verdcourt: 52 (2001); White *et al.*: 410 (2001); Coates Palgrave: 824 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr., cultivated and widely naturalised.

Syzygium Gaertn.

Greves: 175 (1928); Greves: 233 (1933); White: 303 (1962); Amshoff: 99 (1970); White: 193 (1978); Verdcourt: 67 (2001); White *et al.*: 411 (2001); Coates Palgrave: 831 (2002).

Sthn trop. Afr. 8, including **Syzygium cumini* (L.) Skeels which has escaped from cultivation in Zimbabwe and Mozambique [Coates Palgrave: 833 (2002)], Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Nyctaginaceae

(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Jordaan, M. in Leistner: 424 (2000).

Sthn trop. Afr.: genera 5, species 12.

Boerhavia L.

Codd: 113 (1966); Stannard: 20 (1988); Whitehouse: 2 (1996).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Commicarpus Standl.

Meikle: 235 (1978); Stannard: 15 (1988); Whitehouse: 8 (1996).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Mirabilis L.

Stannard: 13 (1988); Whitehouse: 15 (1996).

Sthn trop. Afr. 1: **Mirabilis jalapa* L., introduced from tropical America; now widely cultivated and naturalised in Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Phaeoptilum Radlk.

Grandvaux Barbosa: 195 (1970); Stannard: 28 (1988).

Monotypic genus: *Phaeoptilum spinosum* Radlk.; sthn trop. Afr.: Angola, and sthn Afr.

Pisonia L.

Stannard: 25 (1988); Whitehouse: 17 (1996); Coates Palgrave: 199 (2002).

Sthn trop. Afr. 1: *Pisonia aculeata* L., Mozambique, and sthn Afr., possibly introduced from tropical America.

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Nymphaeaceae
(Magnoliidae—Nymphaeales)
(Basal families)

Dreyer, L.L. & Glen, R.P. in Leistner: 426 (2000).

Sthn trop. Afr.: genus 1, species 7.

Nymphaea L.

Exell & Mendonça: 45, 358 (1937/1951); Mendonça: 175 (1960); Exell: 139 (1970); Mendonça: 1 (1973); Verdcourt: 1 (1989).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Ochnaceae
(Dilleniidae—Theales)
(Eurosids I—Malpighiales)

Archer, R.H. in Leistner: 426 (2000).

Additional family characters: Perennial or annual herbs; leaves sometimes sessile or with amplexicaul petiole; staminodes present, 5 of them petaloid; ovary 1-locular (or 3-locular at the base), with 3 parietal placentas, each bearing many ovules; fruit a capsule with 3 septicidal valves; seeds many, small.

Sthn trop. Afr.: genera 4, species ± 47.

Key to genera

[after Robson (1963)]

1a Fruit a 3-valved septicidal capsule; ovary 1-locular (or 3-locular at the base) with 3 parietal placentas, each bearing many ovules in 2 rows; style terminal; staminodes present; seeds with abundant endosperm; perennial or annual herbs ..... (ALBUMINOSAE) **Sauvagesia**

1b Fruit composed of 1 or more drupelets (often black) on an enlarged red or purplish receptacle; ovary lobed, with (3–)5–15 1-ovulate locules; style gynobasic; staminodes absent; seeds without endosperm; trees, shrubs or shrublets (EXALBUMINOSAE):

2a Stamens 10, with anthers much longer than filaments and dehiscing by apical pores; petals yellow ..... **Ouratea**

2b Stamens 13 or more or, if 8–10, then anthers dehiscing longitudinally and equalling the filaments; petals yellow to orange, pink or white:

3a Stipules entire or fringed or bifid, not striate, deciduous; petals pale yellow to orange (very rarely white); drupelets without internal projection of endocarp; pigment under bark absent ..... **Ochna**

3b Stipules laciniate or deeply divided into linear segments, markedly longitudinally striate, persistent on first-year shoots; petals white to pink; drupelets with internal projection of endocarp; yellow pigment present under the bark ..... **Brackenridgea**

Brackenridgea A.Gray

Robson: 252 (1963); Bamps: 5 (1967); Robson & Garcia: 23 (1973); Coates Palgrave: 733 (2002).

Sthn trop. Afr. 1: *Brackenridgea zanguebarica* Oliv., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ochna L.

Exell & Mendonça: 284 (1951); Robson: 225 (1963); Robson & Garcia: 2 (1973); White *et al.*: 416 (2001); Coates Palgrave: (2002); Izidine & Bandeira: 51 (2002); Mapaura & Timberlake: 166 (2002).

Sthn trop. Afr. 32, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ouratea Aubl.

Aublet: 397 (1775); Exell & Mendonça: 292 (1951); Robson: 255 (1963).

Gomphia Schreb.; Phiri (Unpublished) as synonym. *Campylospermum* Tiegh.; Phiri (Unpublished). *Rhabdophyllum* Tiegh.; Phiri (Unpublished).

Trees or shrubs, usually completely glabrous. **Leaves** petiolate to sessile and amplexicaul; lamina with margin serrate to ciliate or entire; stipules entire, not striate, coriaceous, free or ± united intrapetiolarly, caducous or ± persistent. **Inflorescence** paniculate to racemose or umbellate or rarely reduced to 1 or 2 flowers, terminal or axillary, sometimes at base of current year's growth; bracts scale-like, caducous or ± persistent; pedicels articulated at or above base. **Sepals** 5, quincuncial in bud, green or yellow in flower, persistent and usually enlarging and becoming coriaceous with varying shades of red in fruit. **Petals** 5, yellow or rarely white, not or scarcely unguiculate, deciduous. **Stamens** 10, diplostemonous, free; anthers yellow or orange, elongate and frequently narrowed upwards, often rugose, dehiscing by terminal pores, deciduous; filaments stout, much shorter than anthers, persistent, or absent. **Carpels** 5–10, apparently free at base, 1-ovulate; styles slender, gynobasic, completely united; stigma terminal, not enlarged. **Fruit** of 1 to several free, black or brown 1-seeded drupelets with fleshy

or coriaceous mesocarp, inserted on enlarged red or purplish receptacle. **Seeds** straight or curved, without endosperm or internal projection of endocarp; embryo straight or ± curved, incumbent or accumbent, isocotylous or heterocotylous.

Species ± 150–200, tropics of E and W hemispheres; sthn trop. Afr. ± 12, Angola, Zambia.

Sauvagesia L.

Linnaeus: 203 (1753); Exell & Mendonça: 284 (1951); Robson: 260 (1963); Robson & Garcia: 25 (1973); Amaral: 184 (1991).

Vausagesia Baill.; Exell & Mendonça: 284 (1951); Robson: 262 (1963).

Perennial or annual herbs, completely glabrous, with erect shoots and frequently ± elongate-ascending branches from base; stems slender, wiry, angular. **Leaves** elliptic or oblong-elliptic to oblanceolate, narrowing towards base but usually not petiolate, margin serrulate and incrassate; stipules with laciniate margins, longitudinally striate, free, persistent. **Inflorescence** paniculate to racemose and terminal or reduced to solitary or rarely paired flowers in axils of foliage leaves; pedicels articulated at or above base. **Sepals** 5, quincuncial in bud, green with pale margin, persistent, not enlarging or changing colour in fruit. **Petals** 5, spreading, not unguiculate, deciduous, white to pink. **Androecium** of (2)3 whorls; outer staminodes many in a continuous ring, white in upper parts or wholly crimson to purplish, inner petaloid staminodes 5, free, antepetalous, white with crimson to purplish base, truncate to retuse or eroded at apex; stamens 5, antesepalous, free; filaments short; anthers oblong-linear, dehiscing longitudinally. **Ovary** with 3 parietal placentas (or axile at base), each placenta bearing many ovules in 2 rows; style simple, slender, stigma not enlarged. **Fruit** a capsule with 3 septicidal valves. **Seeds** many, small, with punctate testa.

Species ± 40, tropics of Old and New World; sthn trop. Afr. 2, Angola, Zambia, Mozambique.

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Olacaceae

(Rosidae—Santalales)
(Core Eudicots—Santalales)

Jordaan, M. in Leistner: 427 (2000).

Sthn trop. Afr.: genera 10, species 19.

Key to genera

[after Keay (1958)]

1a Stamens fused into a cylindric tube around the style; calyx strongly accrescent in fruit:
2a Calyx not splitting, much expanded in fruit forming a conspicuous funnel- to bowl-shaped structure around the fruit; branchlets terete; flowers in very short axillary racemes; dioecious shrubs or small trees ..... **Aptandra**
2b Calyx in fruit at length splitting into 2 or 3 segments, at first enveloping the fruit; branchlets compressed or slightly winged; flowers in paniculate clusters, bisexual; large trees ..... **Ongokea**
1b Stamens free from each other but sometimes variously adnate to the petals; calyx accrescent or not:
3a Stamens (plus staminodes, if present) more numerous than the petals; fruit superior, sometimes enveloped by the accrescent calyx:
4a Stamens 3–4 times as many as petals; leaves with main secondary nerves reaching the margin; flowers mostly in panicles ..... **Coula**
4b Stamens (plus staminodes, if present) ± twice as many as petals; leaves with main lateral nerves looped or ending within the margin; flowers in short racemes or fascicles:
5a Calyx much enlarged in fruit and deeply lobed; flowers in few-flowered axillary fascicles ..... **Heisteria**
5b Calyx not enlarged in fruit, or if enlarged then truncate; flowers mostly in short racemes:
6a Branchlets usually armed with spines; staminodes absent; flowers in umbellate racemes; petals densely villous within ..... **Ximenia**
6b Branchlets without spines; flowers in narrow racemes; staminodes present or absent; petals glabrous within or pilose about the middle:
7a Calyx obvious, disciform in fruit or strongly accrescent and enveloping the fruit; petals glabrous within; staminodes present ..... **Olax**
7b Calyx very small, obsolete in fruit; petals pilose about the middle within; staminodes absent ..... **Ptychopetalum**
3b Stamens as many as petals; fruit entirely or partly enclosed by the accrescent receptacle; flowers in axillary clusters or very short racemes; calyx not accrescent in fruit:
8a Flowers 4-merous; anthers fused to the petals for $^1/_3$–$^1/_2$ their length ..... **Strombosiopsis**
8b Flowers 5-merous; anthers not fused to the petals:

9a Fruit completely enclosed by the receptacle ..... **Strombosia**

9b Fruit only partially enclosed by the receptacle which forms an equatorial ridge around the fruit just above its middle ..... **Diogoa**

Aptandra Miers

Miers: 201 (1851); Exell & Mendonça: 337 (1951b); Villiers: 156 (1973).

Monoecious or dioecious shrubs or small trees, with many lenticels. **Leaves** simple, entire; base cuneate, apex mucronate; stipules absent. **Inflorescences** short, many-flowered axillary panicles, or flowers solitary or in pairs. **Flowers** bisexual, male or female. **Calyx** small, cupuliform, much accrescent in fruit. **Petals** 4,valvate, linear, apiculate, with 4 thick, alternipetalous glands. **Stamens** 4, epipetalous, extrorse; filaments fused into a tube around pistil; anthers fused into a ring, opening by annular pores. **Ovary** superior, 2-locular, slightly compressed; ovule 1 per locule; style filiform; stigma globular. **Fruit** a 1-seeded drupe surrounded by a much accrescent, widely funnel- to bowl-shaped, entire, coloured calyx. **Seeds** with fleshy, oily endosperm.

Species 4, 3 in tropical America, 1 in trop. Africa; sthn trop. Afr. 1: *Aptandra zenkeri* Engl., Angola.

Coula Baill.

Baillon: 61 (1862); Exell & Mendonça: 331 (1951b); Keay: 645 (1958); Villiers: 144 (1973).

Tall trees with first branches at a height of 5–6 m; young parts covered with red hairs. **Leaves** simple, entire, glabrous when mature, lower surface red when fresh; secondary veins reaching leaf margin. **Inflorescence**s many-flowered axillary panicles. **Flowers** bisexual. **Calyx** cup-shaped with margin entire to faintly 4- or 5-lobed. **Petals** 4 or 5, free, valvate. **Stamens** free, 3–4 times as many as petals, alterni- and epipetalous with filaments pressed against inner face of petals. **Ovary** 3- or 4-locular with 1 ovule per locule; style short, conical, ending in a 3-lobed stigma. **Fruit** a globose or ellipsoid, glabrous drupe; endocarp woody, rugose. **Seed** 1; testa thin; endosperm starchy and oily.

Monotypic genus: *Coula edulis* Baill., tropical W Africa; sthn trop. Afr.: Angola.

Diogoa Exell & Mendonça

Exell & Mendonça: 109 (1951a); Exell & Mendonça: 336 (1951b); Keay: 648 (1958); Villiers: 150 (1973).

Small to tall trees, non-resinous; bark greenish with many whitish lenticels arranged in horizontal lines. **Leaves** glabrous; veins prominent on upper surface. **Inflorescences**: fascicles or short panicles. **Flowers** bisexual, greenish or yellow. **Calyx** with 5 glabrous, ± elliptic sepals fused at base. **Petals** 5, free to base, lanceolate. **Stamens** 5, epipetalous, free, adpressed to inner face of petals; filaments broad, fleshy and flattened; anthers opening by longitudinal slits. **Disc** adnate to ovary, rugose. **Ovary** (4)5-locular; ovule 1 per locule, pendent from a central placenta; style conical, with channels, terminating in a (4)5-lobed stigma. **Fruit** a ± spherical drupe with a prominent equatorial ridge. **Seed** 1, ± spherical; endosperm copious.

Monotypic genus: *Diogoa zenkeri* (Engl.) Exell & Mendonça, tropical W Africa; sthn trop. Afr.: Angola.

Heisteria Jacq.

Jacquin: 4, 20 (1760) conserved name; Exell & Mendonça: 332 (1951b); Keay: 645 (1958); Lucas: 1 (1968); Villiers: 125 (1973).

Glabrous shrubs or small trees; branches weakly 2-winged. **Leaves** simple, entire. **Inflorescences**: flowers in few- or many-flowered axillary fascicles. **Flowers** bisexual. **Calyx** cup-shaped with entire or undulate margin. **Petals** 5, valvate, free except at base, pubescent on inner face. **Stamens** 10, in 2 whorls: large stamens alternipetalous, smaller ones epipetalous; filaments short, pressed against petals; anthers introrse, dehiscing longitudinally. **Ovary** 3-locular, each locule with 1 ovule; placenta central; style conical, ending in a 3-lobed stigma. **Fruit** a drupe surrounded by strongly accrescent calyx. **Seed** ellipsoid, with yellowish oily endosperm.

Species 35, mostly tropical America, 3 in W trop. Africa; sthn trop. Afr. 2, Angola.

Olax L.

Exell & Mendonça: 333 (1951b); Keay: 646 (1958); Garcia: 331 (1963); Lucas: 6 (1968); Villiers: 110 (1973); Garcia & Vidigal: 5 (1979); Coates Palgrave: 195 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique and sthn Afr.

Ongokea Pierre

Pierre: 1314 (1897); Exell & Mendonça: 338 (1951b); Keay: 649 (1958); Villiers: 159 (1973).

Glabrous, ± dioecious trees with a straight bole; branches compressed, 2-winged. **Leaves** elliptic, base cuneate, apex apiculate. **Flowers** unisexual or bisexual. **Calyx** short, cup-shaped, 4- or 5-dentate. **Petals** 4 or 5, valvate, ± linear, recurved to coiled; fleshy alternipetalous glands present between petals and stamens. **Stamens** epipetalous; filaments and anthers united into a tube completely enclosing gynoecium except for stigma; anthers opening by annular pores. **Ovary** 1-locular with 1 or 2 ovules pendent from an erect free-central placenta; style filiform, ending in a pointed stigma. **Fruit** a drupe opening by 2 or 3 valves at maturity, almost completely hidden inside much accrescent calyx; exocarp smooth; mesocarp fleshy, surrounding thick, hard endocarp except at apex. **Seed** solitary, globose or ovoid, yellow.

Monotypic genus: *Ongokea gore* (Hua) Pierre, tropical W Africa; sthn trop. Afr.: Angola.

Ptychopetalum Benth.

Bentham: 376 (1843); Keay: 647 (1958); White: 42 (1962); Villiers: 146 (1973); Phiri (Unpublished).

Glabrous woody twiners. **Leaves** alternate, lanceolate to lanceolate-elliptic, somewhat leathery.

Species 4: 2 from America, 2 from trop. Africa; sthn trop. Afr. 1: *Ptychopetalum cuspidatum* R.E.Fr., known only from Zambia and described from a single sterile specimen collected about 90 years ago and not collected again since (White 1962).

Strombosia Blume

Blume: 1154 (1826–1827); Exell & Mendonça: 335 (1951b); Keay: 647 (1958); Garcia: 334 (1963); Lucas: 9 (1968); Villiers: 133 (1973); Garcia & Vidigal: 8 (1979); White *et al.*: 418 (2001); Coates Palgrave: 197 (2002).

Large trees; young branches flexuous, green, compressed, later pale brown, cylindric. **Leaves** oblong or ovate-oblong, glabrous. **Flowers** bisexual, fasciculate on very short lateral shoots. **Calyx**: tube adnate to ovary; limb small, with 5 broadly ovate lobes. **Petals** 5, perigynous, valvate, connivent or patent-erect. **Stamens** 5, opposite petals; filaments adnate to petals; anthers dorsifixed. **Ovary** semi-inferior, 3–5-locular at base, covered by disc; ovules 3–5(6), pendulous in middle of locules from top of a central placenta; style short; stigma obtuse. **Fruit** drupaceous, crowned by vestiges of calyx limb; endocarp crustaceous. **Seed** pendulous, with a minute apical embryo, surrounded by fleshy endosperm.

Species ± 12, Old World, mostly Africa; in sthn trop. Afr. 4, Angola, Zimbabwe, Malawi, Mozambique.

Strombosiopsis Engl.

Engler: 148 (1897); Exell & Mendonça: 110 (1951a); Exell & Mendonça: 337 (1951b); Keay: 649 (1958); Lucas: 11 (1968); Villiers: 152 (1973); Breteler: 303 (2001).

Trees up to 30 m high; bark secreting a sticky red resin; young branches angular or 2-winged. **Leaves** simple, entire with secondary veins distinct on lower surface. **Inflorescences** short axillary or extra-axillary panicles or 6- to 25-flowered fascicles. **Flowers** bisexual, regular, white to yellowish. **Calyx** short, 4-toothed, green. **Petals** 4, free except at base, narrowly elliptic, fleshy, glabrous. **Stamens** 4, epipetalous, adpressed against inner face of petals; filaments short, broad; anthers narrowly elliptic. **Ovary** half-inferior to almost completely sunk in a ± quadrangular, 4-lobed, glabrous, fleshy disc; 4-locular, with 1 pendent ovule per locule from a central placenta; style short, conical, ending in a 4-toothed stigma. **Fruit** a drupe with accrescent petiole almost entirely enclosing fruit, with 4 calyx teeth at apex of fruit. **Seed** solitary, with brownish red endosperm.

Species 3, trop. Africa; sthn trop. Afr. 1: *Strombosiopsis tetrandra* Engl., Angola.

Ximenia L.

Exell & Mendonça: 332 (1951b); Keay: 646 (1958); White: 42 (1962); Garcia: 329 (1963); Villiers: 106 (1973); Garcia & Vidigal: 1 (1979); Coates Palgrave: 196 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Oleaceae

(Asteridae—Scrophulariales)
(Euasterids I—Lamiales)

Victor, J.E. in Leistner: 428 (2000).

Sthn trop. Afr.: genera 5, species ± 23.

Chionanthus L.

Stearn: 191 (1980); Kupicha: 320 (1983); White *et al.*: 419 (2001); Bingham & Smith: 142 (2002); Coates Palgrave: 914 (2002).

Linociera Sw. ex Schreb.; White: 337 (1962).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Jasminum L.

Kupicha: 305 (1983); White *et al.*: 419 (2001).

Sthn trop. Afr. ± 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Olea L.

Kupicha: 323 (1983); Herman & Condy: 92 (1997); White *et al.*: 420 (2001); Coates Palgrave: 916 (2002); Green: 91 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schrebera Roxb.

White: 338 (1962); Kupicha: 301 (1983); White *et al.*: 423 (2001); Coates Palgrave: 912 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Oliniaceae

(Rosidae—Myrtales)
(Rosids—Myrtales)

Archer, R.H. in Leistner: 430 (2000).

Sthn trop. Afr.: genus 1, species 2.

Olinia Thunb.

White: 269 (1962); Fernandes & Fernandes: 189 (1970); Verdcourt: 324 (1978); Verdcourt & Fernandes: 2 (1986); White *et al.*: 425 (2001); Coates Palgrave: 771 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Onagraceae

(Rosidae—Myrtales)
(Rosids—Myrtales)

Bredenkamp, C.L. in Leistner: 430 (2000).

Sthn trop. Afr.: genera 3, species 19.

Epilobium L.

Exell: 188 (1929); Fernandes & Fernandes: 199 (1970); Raven: 343 (1978); Raven *et al.*: 15 (1986).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ludwigia L.

Fernandes & Fernandes: 190 (1970); Raven: 333 (1978); Raven *et al.*: 2 (1986).

Jussiaea L.; Exell: 188 (1929).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Oenothera L.

Fernandes & Fernandes: 202 (1970); Raven: 330 (1978).

Weeds of American origin; 6 species recorded as naturalised in Angola, Zambia, and Zimbabwe, but probably found in all countries in sthn trop. Afr.

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Opiliaceae

(Rosidae—Santalales)
(Core Eudicots—Santalales)

Jordaan, M. in Leistner: 431 (2000).

Sthn trop. Afr.: genera 3, species 5.

Key to genera

[after Hiepko (1987)]

1a Disc annular; inflorescence racemose, longer than 100 mm; flowers in groups of 4–8 or solitary ..... **Urobotrya**

1b Disc consisting of free lobes; inflorescence racemose and then shorter than 60 mm, or umbellate:

2a Inflorescence racemose; bracts peltate, broadly ovate to orbicular ..... **Opilia**

2b Inflorescence umbellate; bracts not peltate, lanceolate to ovate ..... **Pentarhopalopilia**

Opilia Roxb.

Exell & Mendonça: 338 (1951); Garcia: 336 (1963); Lucas: 1 (1968); Villiers: 168 (1973); Garcia & Vidigal: 1 (1979); Hiepko: 161 (1982); Dowsett-Lemaire & White: 80 (1990); White *et al.*: 425 (2001).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pentarhopalopilia (Engl.) Hiepko

Hiepko: 280 (1987).

Rhopalopilia sect. *Pentarhopalopilia* Engler; Pierre: 1263 (1896); Exell: 72 (1927); White: 41 (1962); Garcia: 338 (1963); Villiers: 173 (1973); Garçia & Vidigal: 3 (1979).

Shrubs, scandent or occasionally erect; young branches and leaves glabrous or variously pilose. **Leaves** lanceolate or oblong-lanceolate, papyraceous to pergamentaceous, ± distinctly pellucid-punctulate; petiole very short, articulated at base. **Inflorescences** umbellate; peduncle slender, claviform; bracts and bracteoles ovate to lanceolate, usually caducous before anthesis. **Flowers** 5-merous, minute; receptacle flat. **Calyx** cupuliform. **Petals** reflexed, caducous. **Stamens** as many as and opposite petals, free or almost so, exceeding the petals; filaments filiform; anthers dorsifixed. **Disc**: lobes 5, fleshy, often irregularly toothed, alternating with stamens. **Ovary** superior; stigma sessile, entire or shallowly lobed. **Fruit** globose to ellipsoid, with a thin pericarp and a large stone. **Seed** large; embryo terete, embedded in rich endosperm, with 2 or 3 cotyledons.

Species 4: 2 in central Africa and on east coast of Africa, 2 in Madagascar; sthn trop. Afr. 2, Angola, Zambia, Mozambique.

Urobotrya Stapf

Stapf: 89 (1905); Hiepko: 137 (1985).

Shrubs, sometimes climbing; twigs densely puberulous. **Leaves** alternate, petiolate, coriaceous, oblong-elliptic, ovate or somewhat obovate, glabrous above, sparsely hairy beneath. **Inflorescences** racemose, usually solitary, rarely 2 per axil, with flowers solitary or 3–4(5) per bract; rachis slender; bracts narrowly lanceolate, mostly caducous; bracteoles very small, ovate. **Flowers** bisexual, 3–5-merous. **Tepals** free, oblong, acute. **Stamens** epitepalous, exceeding perianth; filaments filiform, white; anthers elliptic. **Disc** annular, fleshy. **Ovary** conical to cylindric; stigma sessile. **Fruit** an ellipsoidal or subglobose, red to orange drupe; mesocarp fleshy-juicy to coriaceous; endocarp crustaceous to woody. **Seed** large with basal hilum; embryo with 2 or 3 long cotyledons.

Species 7: 5 in tropical Asia, 2 in W and C Africa; sthn trop. Afr. 1: *Urobotrya sparsiflora* (Engl.) Hiepko, NE Angola.

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Oxalidaceae

(Rosidae—Geraniales)
(Eurosids I—Oxalidales)

Dreyer, L.L. & Makwarela, A.M. in Leistner: 432 (2000).

Sthn trop. Afr.: genera 2, ± 18.

Biophytum DC.

Exell & Mendonça: 263 (1951); Exell: 156 (1963); Exell & Gonçalves: 8 (1969); Bingham & Smith: 143 (2002).

Species 50, tropics; sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Oxalis L.

Exell & Mendonça: 261 (1951); Exell: 149 (1963); Exell & Gonçalves: 1 (1969); Lebrun & Stork: 336 (2003).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Pandaceae

(Rosidae—Euphorbiales)
(Eurosids I—Malpighiales)

Trees or shrubs, dioecious. **Leaves** alternate, distichous, simple, entire to serrate, often asymmetric at base, petiolate; stipules small, usually persistent, adaxial one arising below abaxial one. **Inflorescences** axillary or supra-axillary fascicles or racemes, often on old wood. **Flowers** unisexual, regular, small. **Calyx** cupular, truncate or 5-lobed; lobes imbricate or open. **Petals** 5, free, contorted, imbricate or valvate, flattened or galeate-cucullate. **Disc** intrastaminal, small or 0. **Male flowers**: stamens 5 or 10, in 1 series or in 2 and then alternately longer and shorter, absent in female flowers or represented by staminodes; anthers 2-thecous, introrse or latrorse, opening lengthwise; pistillode linear-subulate, cylindric or narrowly conical. **Female flowers**: ovary superior, 2–5-locular, with 1(2) apical, pendulous, orthotropous or anatropous ovules per locule, without obturator; styles 1–5, simple or bipartite. **Fruit** a drupe; mesocarp fleshy; endocarp woody, bony or stony, usually tubercled, muricate, pitted or ridged. **Seeds** usually flattened-concave, ecarunculate; endosperm copious, oily; cotyledons broad.

Genera 3, Old World, tropical rainforest in W and C Africa, SE Asia, Malaysia and Indonesia; sthn trop. Afr. genera 2, species 2.

Engler & Gilg: 223 (1912/1913); Exell & Mendonça: 302 (1954/1956); Foreman: 309 (1966); Vaughan & Rest: 215 (1969); Villiers: 14 (1973); Radcliffe-Smith: 581 (1988); Kapil & Bhatnagar: 145 (1994); Webster: 33 (1994); Stuppy: 209 (1996); Savolainen *et al.*: 266 (2000); Radcliffe-Smith: 125 (2001) under Euphorbiaceae—Acalyphoideae—Galearieae; Angiosperm Phylogeny Group: 433 (2003).

Key to genera

Inflorescences axillary; flowers solitary or in glomerules; male petals imbricate; leaves usually pellucid-punctate; ovules anatropous ..... **Microdesmis**

Inflorescences terminal or on old wood, pseudoracemose-thyrsiform; male petals valvate or ± imbricate; leaves not pellucid-punctate; ovules orthotropous ..... **Panda**

Microdesmis Hook.f. ex Hook.

Hooker: t. 758 (1848); Hiern: 967 (1900); Hutchinson: 741 (1912); Léonard: 102 (1962); Villiers: 18 (1973); Radcliffe-Smith: 581 (1988); Webster: 68 (1994) under Euphorbiaceae; Radcliffe-Smith: 126 (2001) under Euphorbiaceae.

Dioecious shrubs or trees, sometimes lianescent; hairs simple. **Leaves** alternate, petiolate, simple, entire or dentate, penninerved, pellucid-dotted; stipules small, usually persistent. **Inflorescences**: flowers small, shortly pedicellate, fasciculate in leaf axils; male ones multiflowered, female ones few or nearly solitary. **Male flowers**: sepals (4)5(6), imbricate; petals 5, free, larger than sepals, imbricate-contorted; stamens 5, antesepalous, arising on a fleshy disc or receptacle adnate to the rudimentary ovary; filaments short; anthers small, with ± parallel thecae dehiscing longitudinally; rudimentary ovary columnar, ovoid or trifid. **Female flowers**: calyx and petals as in male flowers; disc absent; ovary 2–5-locular, fleshy in upper part; styles 2–5, short, bipartite, papillose-laciniate; ovule solitary in each cell. **Fruit** an indehiscent drupe, hardly lobed and smooth when fresh, mesocarp fleshy, endocarp woody, muricate, (1)2–5-locular, black. **Seeds** without caruncle; testa crustaceous, shiny; cotyledons ovate, flat; endosperm fleshy.

Species 10, palaeotropical: 2 Asian, 8 African; sthn trop. Afr. 2, Angola.

Panda Pierre

Pierre: 1255 (1896); Exell & Mendonça: 27 (1954/1956); Villiers: 15 (1973); Keay: 634 (1958); Radcliffe-Smith: 581 (1988); Webster: 68 (1994) under Euphorbiaceae; Radcliffe-Smith: 128 (2001) under Euphorbiaceae.

Small dioecious trees; branchlets slightly angular; buds in shoot axils, not leaf axils; indumentum simple. **Leaves** alternate, simple, serrulate, asymmetrical and ± cuneate at base; stipules minute. **Inflorescences** racemose, racemes on old wood fasciculate; female flowers solitary or paired, sometimes in shoot axils. **Calyx** cupular, truncate or faintly toothed. **Petals** 5, valvate below, faintly imbricate above, glabrous. **Stamens** 10, in 2 whorls of 5, 5 outer ones episepalous with long filaments, 5 inner ones epipetalous with short filaments; anthers basifixed; longitudinally dehiscent. **Disc** 0. **Ovary** (2)3- or 4-locular; ovule 1 per locule, pendent, orthotropous; stigmas (2)3 or 4, undivided, reflexed; pistillode present in male flowers. **Fruit** drupaceous, (2)3- or 4-seeded, ± 50 mm in diameter, very tardily dehiscent into (2)3 or 4 valves, leaving a large tri- or tetrapterygoid columella. **Seeds** obtriangular, flattened; testa thinly coriaceous, greyish; endosperm copious, oleaginous; cotyledons cordate, truncate.

Monotypic: *Panda oleosa* Pierre, west trop. Africa; sthn trop. Afr.: Angola.

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*Papaveraceae

(Magnoliidae—Ranunculales)
(Eudicots—Ranunculales)

Jordaan, M. in Leistner: 433 (2000).

Sthn trop. Afr.: genus 1, species 1.

*Argemone L.

Exell & Mendonça: 48 (1937/1951); Exell: 180 (1960); Exell & Gonçalves: 1 (1973); Phiri (Unpublished).

Sthn trop. Afr. 1: **Argemone mexicana* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Passifloraceae

(Dilleniidae—Violales)
(Eurosids I—Malpighiales)

Archer, R.H. in Leistner: 434 (2000).

Sthn trop. Afr.: genera 8, species ± 60.

Key to genera

1a Trees or shrubs, without tendrils; leaves ± coriaceous, sometimes glandular-dentate; flowers 5-merous, bisexual, with a well-developed corona:
  2a Style single, with 1 (sometimes faintly lobed) stigma; corona double; stamens many ..... **Barteria**
  2b Styles (2)3–5(6); corona single or double; stamens 5 or 8–16:
    3a Corona double; stamens 8–11; small erect trees with palm-like habit ..... **Paropsiopsis**
    3b Corona single; habit not palm-like:
      4a Stamens 10–16; petiole with 2 glands at the apex ..... **Viridivia**
      4b Stamens 5; petiole without glands at the apex ..... **Paropsia**
1b Shrubs, climbers or perennial herbs, usually with tendrils; leaves often membranous, sometimes coriaceous; flowers bisexual or unisexual; corona single or double or sometimes wanting:
  5a Flowers unisexual, bisexual or polygamous; corona absent or poorly developed (comprising a laciniate rim or membrane or a row of filaments or hairs); leaves usually with glands at the apex of the petiole or near the base of the lamina ..... **Adenia**
  5b Flowers bisexual, with a well-developed single or sometimes double corona; petiole with or without glands at the apex:
    6a Sepals 3(4); petals (2)4; stamens 6(8); style single, very short, with a (3)4-lobed stigma; seeds smooth; petiole with glands at the apex; tendrillous heterophyllous shrub ..... **Schlechterina**

6b Sepals 5 or 6; petals 5 or 0; stamens 5 or 6; styles 3(4), each one with a capitate stigma; seeds alveolate-reticulate; petiole without glands at the apex; herbs or climbers:

7a Flowers small, whitish or greenish, in axillary ± long-pedunculate few-flowered inflorescences, the peduncle often ending in a ± well-developed tendril ..... **Basananthe**

7b Flowers large and showy (passion-flowers), axillary and solitary; strong climbers ..... ***Passiflora**

Adenia Forssk.

Fernandes & Fernandes: 217 (1970); De Wilde: 18 (1975); Fernandes & Fernandes: 385 (1978); Fernandes & Fernandes: 15 (1980); Percy-Lancaster & Richards: 77 (1992); Robyns: 36 (1995); White *et al.*: 427 (2001); Bingham & Smith: 143 (2002); Coates Palgrave: 769 (2002); De Wilde: 337 (2002); Izidine & Bandeira: 51 (2002); Mapaura & Timberlake: 168 (2002).

Sthn trop. Afr. 31, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Barteria Hook.f.

Hooker: 14 (1860); Fernandes & Fernandes: 215 (1970); De Wilde: 3 (1975); Breteler: 307 (1999).

Shrubs or trees without tendrils; branchlets usually hollow and often inhabited by ants. **Leaves** alternate or subdistichous, not lobed, elliptic to lanceolate, usually leathery, subsessile or petiole short, often shortly winged and decurrent on branches as a ridge; margin finely crenulate to subentire, set with many small glands; stipules small, caducous. **Inflorescences** axillary, sessile, either up to 4-flowered fascicles or horseshoe-shaped and 4–9-flowered, or flowers solitary; bracts many, imbricate, brown. **Flowers** bisexual, large, fragrant, sessile; hypanthium thickish, shallowly cup-shaped. **Sepals** 5, free, imbricate, large. **Petals** 5, imbricate, resembling sepals. **Corona** double: outer one membranous, tubiform, straight or ± folded, with laciniate margin; inner one low, fleshy, with shallowly lobed margin. **Stamens** many, nearly hypogynous, arranged ± in 2 rows; filaments united into a tube in lower $^1/_4$–$^1/_2$; anthers 2-thecous, sub-basifixed, oblong-linear. **Ovary** sessile, placentas 3 or 4, many-ovuled; style single, thick, conspicuous, intruding in stigma; stigma large, hemispherical to obtuse-conical, smooth, entire or distally ± 3(4)-lobed, often larger than ovary. **Fruit** coriaceous, perhaps indehiscent but showing 3(4) valve sutures, subglobose, subsessile. **Seeds** many, ovoid, ± flattened, arillate; testa crustaceous, minutely pitted.

Species 4, trop. Africa; sthn trop. Afr. 2, Angola.

Basananthe Peyr.

De Wilde: 327 (1973); De Wilde: 55 (1975); Fernandes & Fernandes: 376 (1978); Fernandes & Fernandes: 9 (1980); Robyns: 18 (1995).

Tryphostemma Harv., Fernandes & Fernandes: 226 (1970).

Sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Paropsia Noronha ex Thouars

Fernandes & Fernandes: 212 (1970); De Wilde: 5 (1975); Fernandes & Fernandes: 371 (1978); Fernandes & Fernandes: 3 (1980); Coates Palgrave: 769 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Paropsiopsis Engl.

Engler: 391 (1891); Gilg: 415 (1925); Exell: 191 (1929); Fernandes & Fernandes: 215 (1970).

Small, erect trees with palm-like habit; branches spreading, reddish-pubescent. **Leaves** alternate, membranous, with very short, densely reddish brown-pubescent petioles; lamina oblong with acute to long-acuminate apex and rounded to slightly cordate base, penninerved, margin remotely and abruptly glandular-dentate; stipules lanceolate, long-acuminate, tomentose. **Flowers** bisexual, large, solitary in leaf axils, on short, reddish brown-pubescent pedicels. **Sepals** 5, large, imbricate, lanceolate, pubescent on both faces. **Petals** 5, resembling sepals but slightly narrower, minutely pubescent on both faces. **Stamens** 8–11, arising at base of ovary; filaments filiform; anthers elongate, attached shortly above cordate base, 2-thecous, longitudinally dehiscent. **Corona** double: outer one short, irregularly laciniate; inner one very short, annular, slightly fleshy. **Ovary** subglobose, tomentose, on a short but distinct androgynophore; styles 3–5, filiform; stigmas capitate.

Species 7, tropical W Africa; sthn trop. Afr. 1: *Paropsiopsis ferruginea* Exell, Angola (Cabinda).

***Passiflora** L.

Fernandes & Fernandes: 229 (1970); De Wilde: 11 (1975); Fernandes & Fernandes: 407 (1978); Fernandes & Fernandes: 35 (1980); Robyns: 10 (1995).

Widely cultivated, with 6 species recorded from the region, of which at least some have become naturalised; Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schlechterina Harms

De Wilde: 63 (1975); Fernandes & Fernandes: 374 (1978); Fernandes & Fernandes: 5 (1980).

Monotypic genus: *Schlechterina mitostemmatoides* Harms, Mozambique, and sthn Afr.

Viridivia J.H.Hemsl. & Verdc.

Hemsley & Verdcourt: t. 3555 (1956); White: 268 (1962); De Wilde: 9 (1975); Fernandes & Fernandes: 369 (1978); Robyns: 3 (1995).

Small trees or shrubs without tendrils. **Leaves** mostly ovate or elliptic, denticulate, hairy on both surfaces. **Flowers** bisexual, usually developing before leaves, in dense racemes at end of short branches; bracts small, carinate, acute, soon caducous. **Sepals** 4, imbricate, sericeous outside, 3–7-nerved. **Petals** 4, smaller than sepals, 1-nerved. **Corona** shortly tubular, irregularly fimbriate and with clavate whitish glands. **Stamens** 10–16; filaments free and hairy; anthers oblong. **Ovary** globose, stipitate, 1-locular; styles 4–6 with fleshy, kidney-shaped stigmas; ovules ± 50, anatropous, arranged in 2 rows on 4 or 5 placentas. **Capsule** subglobose, stipitate. **Seeds** ovoid, compressed, included in a cupulate aril.

Monotypic genus: *Viridivia suberosa* J.H.Hemsl. & Verdc., SW Tanzania and Zambia.

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Pedaliaceae

(Asteridae—Scrophulariales)
(Euasterids I—Lamiales)

Smithies, S.J. in Leistner: 436 (2000).

Sthn trop. Afr.: genera 10, species 27.

Key to genera

[partly after Ihlenfeldt (1988)]

1a Spiny shrubs or small trees, soft-stemmed, and with trunks usually swollen at the base ..... **Sesamothamnus**

1b Herbs or subshrubs, annual or perennial, erect or prostrate, sometimes with short swollen stems:

2a Fruit with 4 broad, parchment-like wings:

3a Erect annuals; corolla yellow-green to white, tube with a conspicuous sac-like spur at the base ..... **Holubia**

3b Perennials with a short persistent stem and a tuberous root or a swollen tuber-like, partially subterranean stem; corolla yellow, orange, red or purple, tube often slightly swollen at the base but not conspicuously spurred ..... **Pterodiscus**

2b Fruit without parchment-like wings:

4a Fruit a dehiscent, non-woody capsule; erect annuals or perennial herbs:

5a Locules of ovary/capsule of different size, only the larger, abaxial locule dehiscing; capsule with tubercles or conical spines or horns in basal portion ..... **Rogeria**

5b Locules of ovary of equal size; horns, if present, in apical portion:

6a Capsule with 4 spreading horns at the apex; seeds never winged; largest leaves usually sagittate or 3-lobed ..... **Ceratotheca**

6b Capsule without horns at the apex; seeds sometimes conspicuously winged; leaves very variable ..... **Sesamum**

4b Fruit woody, either indehiscent or tardily dehiscent only at the apex, armed with spines or hooks, or unarmed and walnut-like:

7a Fruit disc-like with 2 erect conical spines from near the centre; flowers on long slender pedicels; corolla obliquely campanulate, ±2-lipped, white or pink, the tube streaked with darker colour inside ..... **Dicerocaryum**

7b Fruit not disc-like; flowers sessile or on short pedicels, usually purple or yellow, corolla tube either funnel-shaped or cylindric and constricted at the base, corolla lobes nearly equal or lower lip distinctly larger than upper:

8a Fruit laterally compressed, ovate or oblong in lateral view, with 2 obtuse protuberances on each face and either with 2 rows of curved arms along both margins, each bearing recurved spines, or margins with 2 rigid wings bearing recurved spines; procumbent perennial herbs with tuberous roots; ovules and seeds many ..... **Harpagophytum**

8b Fruit subpyramidal with 4 spines at the basal angles, or walnut-like with tubercles but no spines; ovules and seeds not more than 4:

9a Erect or ascending annual herbs; corolla subequally 5-lobed, yellow; fruit subpyramidal, 4-angled with a spreading spine at each basal angle ..... **Pedalium**

9b Subshrubs with thick cylindric rootstock and prostrate to ascending branches; corolla with a distinctly enlarged lower lip, dark violet; fruit resembling a walnut, with tubercles and without spines ..... **Linariopsis**

Ceratotheca Endl.

Ihlenfeldt: 58 (1967); Abels: 224 (1975); Ihlenfeldt: 94 (1988); Ihlenfeldt:

1069 (1994b).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dicerocaryum Bojer

Ihlenfeldt: 59 (1967); Bruce: 421 (1953); Abels: 222 (1975); Ihlenfeldt: 106 (1988); Ihlenfeldt: 1065 (1994b).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Harpagophytum DC. ex Meisn.

Ihlenfeldt: 65 (1967); Ihlenfeldt & Hartmann: 15 (1970); Ihlenfeldt: 109 (1988).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Holubia Oliv.

Ihlenfeldt: 64 (1967); Ihlenfeldt: 89 (1988).

Monotypic genus: *Holubia saccata* Oliv.; sthn trop. Afr.: Zimbabwe, and sthn Afr.

Linariopsis Welw.

Welwitsch: 53 (1869); Exell *et al.*: 126 (1930); Ihlenfeldt: 60 (1967).

Suffrutices with thick, cylindric to fusiform rootstock and prostrate to ascending, villose-pubescent branches. **Leaves** opposite, ovate to elliptic, subsessile to shortly petiolate, margin ciliate, repand to remotely dentate, with small scales, especially on lower surface. **Flowers** solitary, axillary; bracts acicular, with stipitate extrafloral nectaries in axils of bracts. **Calyx** 5-partite, much shorter than corolla tube; segments linear-lanceolate. **Corolla**: tube narrow at base, widening gradually, without distinct basal sac; anterior lobe enlarged, forming a distinct lower lip; dark violet. **Stamens** didynamous; staminode ± absent; anthers oblong, dorsifixed, without apical gland; thecae parallel, dehiscing longitudinally. **Disc** small, annular. **Ovary** 2-locular, without indication of false septa; ovule 1 per locule, erect, basal; style filiform; stigma shortly bifid. **Fruit** nut-like, reminiscent of a walnut, broadly oblong in outline to subovoid, tuberculate and with a weak median rib, indehiscent or very tardily apically dehiscent, ± 1-locular due to reduction of septum. **Seeds** 2, obovate, somewhat compressed, smooth, sometimes with narrowly winged margin.

Species 3, trop. Africa; sthn trop. Afr. 1: *Linariopsis prostrata* Welw. endemic in Angola.

Pedalium L.

Linnaeus: 1123 (1759); Ihlenfeldt: 64 (1967); Ihlenfeldt: 109 (1988); Ihlenfeldt: 1070 (1994b).

Erect or ascending annual herbs; stems simple or branched. **Leaves** petiolate, oblong to obovate, entire or coarsely dentate, subsucculent. **Flowers** solitary in leaf axils. **Corolla**: tube subcylindric or narrowly funnel-shaped; limb spreading, subequally 5-lobed, yellow. **Stamens** included; thecae divergent; staminodium present or absent. **Ovary** bilocular, undivided, each locule with 2 pendulous ovules. **Fruit** indehiscent, subpyramidal, 4-angled, rounded to acute at apex and with a spreading spine at each basal angle, then abruptly contracted into a narrow collar below; mesocarp spongy. **Seeds** 1 or 2 in each locule, narrowly oblong in outline.

Monotypic genus: *Pedalium murex* L., Old World tropics; sthn trop. Afr.: Mozambique.

Pterodiscus Hook.

Ihlenfeldt: 68 (1967); Ihlenfeldt: 89 (1988); Ihlenfeldt: 5 (2000); Ihlenfeldt: 351 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rogeria J.Gay ex Delile

Ihlenfeldt: 69 (1967); Ihlenfeldt: 1067 (1994b).

Sthn trop. Afr. 2, Angola, and sthn Afr.

Sesamothamnus Welw.

Bruce: 417 (1953); Ihlenfeldt: 61 (1967); Ihlenfeldt: 87 (1988); Ihlenfeldt: 1064 (1994b); Coates Palgrave: 1014 (2002); Ihlenfeldt: 355 (2002).

Sthn trop. Afr. 2, Angola, Zimbabwe.

Sesamum L.

Ihlenfeldt: 55 (1967); Ihlenfeldt & Grabow-Seidensticker: 53 (1979); Ihlenfeldt: 97 (1988); Ihlenfeldt: 395 (1994a); Ihlenfeldt: 1066, 1068 (1994b).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Pentadiplandraceae
(Dilleniidae—Capparidales)
(Eurosids II—Brassicales)

Arborescent shrubs or climbers. **Leaves** alternate, petiolate, simple, oblong-ovate, obliquely cuspidate-acuminate, penninerved, entire, glabrous; stipules 0. **Inflorescences** short, axillary and terminal racemes. **Flowers** regular, unisexual or bisexual; bracts small, subulate. **Sepals** 5, free, imbricate, lanceolate. **Petals** 5, free and lanceolate above but basal parts scale-like, thicker and loosely connivent. **Stamens** 9–13, arising on a short stout androgynophore; filaments free, filiform; anthers basifixed, 2-thecous, introrse, longitudinally dehiscent; represented by staminodes in female flowers. **Ovary** superior, 4- or 5-locular, borne at apex of stout gynophore; ovules axillary (not parietal as stated in Villiers 1973: 163), many, in 2 or 3 rows; style 4- or 5-fid at apex; ovary rudimentary in male flowers. **Fruit** a rounded berry. **Seeds** many, small, reniform, immersed in pulp.

Genus 1, species 1, W trop. Africa.

Exell & Mendonça: 340 (1937/1951); Keay: 649 (1958).

Pentadiplandra Baill.

Baillon: 611 (1886); Exell & Mendonça: 340 (1937/1951); Keay: 651 (1958); Villiers: 163 (1973); Bayer: 499 (2000).

Description as for family.

Monotypic genus: *Pentadiplandra brazzeana* Baill. (=*P. gossweileri* Exell); sthn trop. Afr.: Angola.

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Phytolaccaceae
(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Jordaan, M. in Leistner: 442 (2000).

Sthn trop. Afr.: genera 4, species 6.

Hilleria Vell.

Stannard: 167 (1988); Lebrun & Stork: 288 (2003).

Sthn trop. Afr. 1: *Hilleria latifolia* (Lam.) H.Walter, Angola, Mozambique, and sthn Afr., perhaps an introduction from S America.

Lophiocarpus Turcz.

Stannard: 169 (1988).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Phytolacca L.

Stannard: 164 (1988); White: 46 (1962); White *et al.*: 430 (2001).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Rivina L.

Stannard: 169 (1988).

Sthn trop. Afr. **Rivina humilis* L., Zimbabwe, Mozambique, and sthn Afr., introduced from subtropical and tropical America.

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Piperaceae
(Magnoliidae—Piperales)
(Magnoliids—Piperales)

Jordaan, M. in Leistner: 444 (2000).

Sthn trop. Afr.: genera 2, species 11.

Peperomia Ruiz. & Pav.

Düll: 56 (1973); Verdcourt: 9 (1996); Diniz: 29 (1997); Immelman: 27 (2000).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Piper L.

Burtt Davy *et al.*: 80 (1958); Verdcourt: 1 (1996); Diniz: 25 (1997); Immelman: 25 (2000); White *et al.*: 432 (2001); Coates Palgrave: 120 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Pittosporaceae

(Rosidae—Rosales)
(Euasterids II—Apiales)

Jordaan, M. in Leistner: 444 (2000).

Sthn trop. Afr.: genus 1, species 2.

Pittosporum Banks ex Sol.

Exell & Mendonça: 87, 362 (1937/1951); Cufodontis: 298 (1960); White: 66 (1962); Cufodontis & Faria: 2 (1973); Friis: 319 (1987); Killick: t. 2026 (1991); White *et al.*: 433 (2001); Coates Palgrave: 241 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Plantaginaceae

(Asteridae—Plantaginales)
(Euasterids I—Lamiales)

Welman, W.G. in Leistner: 446 (2000).

Sthn trop. Afr.: genus 1, species 3.

Plantago L.

Hiern: 881 (1900); Hepper: 306 (1963); Verdcourt: 1 (1971); Lisowski *et al.*: 1 (1972); Lehmann: 9 (1988); Rahn: 145 (1996); Glen: 151 (1998).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr., widely distributed weeds; only 1 species: *Plantago palmata* Hook.f., is probably indigenous.

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Plumbaginaceae

(Caryophyllidae—Plumbaginales)
(Core Eudicots—Caryophyllales)

Bredenkamp, C.L. in Leistner: 447 (2000).

Sthn trop. Afr.: genera 2, species 4.

Dyerophytum Kuntze

Dyer: 19 (1963); Kubitzki: 527 (1993).

Vogelia Lam.; Hiern: 635 (1898).

Sthn trop. Afr. 1: *Dyerophytum africanum* (Lam.) Kuntze, Angola, and sthn Afr.

Plumbago L.

Hiern: 634 (1898); Hepper: 306 (1963); Wilmot-Dear: 5 (1976); Vickery: 181 (1983); Kubitzki: 527 (1993).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Podostemaceae
(including Tristichaceae)
(Rosidae—Podostemales)
(Eurosids I—Malpighiales)

Glen, R.P. in Leistner: 448 (2000). General family reference: Philbrick & Novelo: 210 (1995).

Sthn trop. Afr.: genera 8, species ± 20.

Key to genera

1a Flower never enclosed within a spathella (a membranous sac), but subtended by 2 scarious bracts larger than the scale-like leaves; tepals 3, scarious, connate below; ovary 3-locular ..... **Tristicha**

1b Flowers enclosed within a spathella before anthesis; tepals 2, minute, free, filiform or absent, lateral to, and shorter than the androecium; ovary 1- or 2-locular:

2a Capsule smooth, spherical, dehiscing into 2 caducous valves:

3a Flowers erect within the spathella before anthesis; gynophore very short ..... **Letestuella**

3b Flowers inverted (bent backwards) within the spathella before anthesis; gynophore well-developed ..... **Leiothylax**

2b Capsule longitudinally ribbed, dehiscing into 2 persistent or caducous valves:

4a Filaments free or nearly so; capsule dehiscing by 2 equal valves:

5a Stamens 3(4); ovary with 1 subsessile, capitate stigma ..... **Angolaea**

5b Stamens 2; ovary with 2 conical stigmas slightly fused at the base ..... **Dicraeanthus**

4b Filaments fused in lower half; capsule dehiscing by unequal or equal valves:

6a Flowers erect within the spathella; capsule dehiscing by 2 equal valves; pedicel short, scarcely carrying the flower beyond the spathella after anthesis ..... **Saxicolella**

6b Flowers inverted (bent backwards) within the spathella; capsule dehiscing by 2 unequal valves: a larger persistent one and a smaller caducous one; pedicel well-developed:

7a Capsule globose to subglobose, the smaller valve caducous; scale-like leaves absent ..... **Sphaerothylax**

7b Capsule ovoid-ellipsoidal, one or both valves caducous; scale-like leaves dentate, many and overlapping on the branches bearing the flowers and ± scattered on the stems ..... **Ledermanniella**

Angolaea Wedd.

Weddell: 300 (1873);Weddell: 208 (1874); Oliver: t. 2357 (1895); Baker & Wright: 123 (1909); Engler: 3 (1930); Hess: 370 (1953).

Herbs attached to rocks in fast-flowing freshwater, resembling a seaweed; stem and primary branches thick, transparent, green. **Leaves** dichotomously divided into linear segments. **Flowers** bisexual, each enclosed in an irregularly bursting spathella (a membranous sac), either solitary near sinus of dichotomies or 2–5 in umbellate cymes near ends of branchlets; bracts similar to leaves but shorter and with flattened segments; spathella calyx-like, pedicellate and bursting by 3–5 unequal lobes. **Tepals** 2, minute. **Stamens** 3(4); filaments slightly flattened, free or 2 connate at base; anthers 2-thecous, oblong; pollen grains in diads, pale yellow. **Ovary** 1-locular, stipitate, ellipsoid to narrowly obovoid, somewhat shorter than stamens; stigma subsessile, capitate, obliquely ovoid to hemispherical, papillose; placenta central, swollen, multi-ovulate. **Capsule** ovoid, 8-ribbed, dehiscing by 2 equal valves. **Seeds** many.

Monotypic genus: *Angolaea fluitans* Wedd., endemic in Angola.

Dicraeanthus Engl.

Engler: 94 (1905); Baker & Wright: 126 (1909); Engler: 46 (1930); Cusset: 66 (1987).

Herbs attached to rocks in fast-flowing freshwater; basal part thalloid, bearing long simple or branched branches floating in

current. **Leaves** alternate, arranged all along branches at regular intervals, usually ± dichotomously divided. **Flowers** arranged in pedieelled or sessile inflorescences, either on main branches or on short branches in leaf axils; spathellas each enclosing an inverted flower, ovoid or ellipsoid, opening irregularly from the apex; pedicel far exserted after anthesis. **Tepals** 2. **Stamens** 2, surrounded by tepals, usually shorter than ovary; filaments fused in basal part; anthers introrse; pollen in diads. **Ovary** unilocular, very narrowly ellipsoid, borne on a well-developed gynophore; placenta central; ellipsoid, bearing many anatropous ovules; stigmas 2, conical; slightly fused at base. **Capsule** 8-ribbed, dehiscing by 2 equal valves remaining attached at apex. **Seeds** many, small, with reticulate testa.

Species 2, W trop. Africa; sthn trop. Afr. ?1, Angola (record not confirmed).

Ledermanniella Engl.

Cusset: 361 (1983); Cusset: 249 (1984); Cusset: 69 (1987); Cook: 183 (1990); Cusset: 2 (1997).

Inversodicraea Engl. ex R.E.Fr.; Hess: 363 (1953); Obermeyer: 208 (1970).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Leiothylax Warm.

Warming: 147, 154 (1899); Baker & Wright: 124 (1909); Cusset: 202 (1980); Cusset: 52 (1987); Cook: 183 (1990); Cusset: 4 (1997).

Submerged freshwater herbs; basal part thalloid, foliaceous or ribbon-like. **Stems** long, simple or divaricately branched. **Leaves** dichotomously branched, segments linear. **Spathellas** (spathaceous bracts) in clusters along the stems, ovoid to subspherical, rupturing irregularly at the apex at anthesis; flower inverted (reflexed) within the spathella before anthesis. **Pedicel** long-exserted after anthesis, bearing the flower erect. **Tepals** 2, minute, one on each side of the andropodium. **Stamens** 2(3); filaments joined for at least half their length; anthers 2-locular, introrse; pollen in monads. **Ovary** spherical, 1-locular with central placentation, borne on a well-developed gynophore and surmounted by 2 free styles; placentas globular, bearing many anatropous ovules. **Capsule** smooth, globose, dehiscing into 2 equal caducous valves. **Seeds** many, small, red-brown, testa reticulate.

Species 3, trop. Africa; sthn trop. Afr. 3, Angola, Zambia.

Letestuella G.Taylor

Cusset: 54 (1987); Cook: 183 (1990); Lebrun & Stork: 234 (2003).

Leiothylax of different authors; Hess: 369 (1953); Obermeyer:208 (1970).

Monotypic genus: *Letestuella tisserantii* G.Taylor, W trop. Africa; sthn trop. Afr.: Angola, and sthn Afr.

Saxicolella Engl.

Engler: 456 (1926); Engler: 48 (1930); Cusset: 92 (1987).

Submerged freshwater herbs; basal part thalloid, ribbon-like or foliaceous; plants ± stemless or forming well-developed stems. **Leaves** linear, simple, ± dichotomously divided, or laciniate. **Flowers** solitary or in groups, pedicellate or sessile, erect inside an ellipsoid or narrowly ovoid spathella dehiscing irregularly from apex at anthesis. **Tepals** 2. **Stamen** 1 surrounded by tepals, longer than ovary; anther introrse; pollen in diads. **Ovary** 1-locular, ellipsoid to fusiform, borne on a very short gynophore; placenta central, narrowly ellipsoid, pedicellate or sessile, bearing many anatropous ovules; stigmas 2, linear. **Capsule** ellipsoid, with 8 narrow ribs, dehiscing into equal, persistent valves. **Seeds** many, ellipsoid, slightly flattened, with reticulate testa.

Species 2, tropical W Africa; sthn trop. Afr. ?2, Angola.

Sphaerothylax Bisch.

Cook: 188 (1990); Cusset: 6 (1997); Lebrun & Stork: 236 (2003).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tristicha Thouars

Baker & Wright: 121 (1909); Hess: 371 (1953); Cusset & Cusset: 169 (1988); Cusset: 8 (1997).

Monotypic genus: *Tristicha trifaria* (Bory ex Willd.) Spreng., pantropical, very variable; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Placed in Tristichaceae by Cusset: 97 (1987) and Cusset & Cusset: 149 (1988).

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Polygalaceae
(Rosidae—Polygalales)
(Eurosids I—Fabales)

Bredenkamp, C.L. in Leistner: 449 (2000).

Sthn trop. Afr.: genera 5, species 86.

Key to genera

[after Keay (1954) and Exell (1960)]

1a Petals 5, subequal, united into a tube at the base; stamens 5; fruit drupaceous:
2a Fruit fleshy, yellow or red; seeds very densely villous, with copious fleshy endosperm ..... **Carpolobia**
2b Fruit hard, crustaceous; seeds finely hairy, without endosperm ..... **Atroxima**
1b Petals 3 (others minute or absent); stamens usually 7 or 8 (4–8); fruit a capsule or samara:
3a Petals free; fruit a samara (1-seeded, indehiscent and winged) ..... **Securidaca**
3b Petals united, the 2 upper ones joined to the keel; fruit a capsule:
4a Keel appendage 2-lobed, expanded and leaf-like; flowers solitary; stamens 7 ..... **Muraltia**
4b Keel appendage (crest) fimbriate or at least many-lobed (rarely absent); flowers in racemes (some flowers solitary in *P. erioptera*); stamens 8 (or 6 fertile and 2 sterile) ..... **Polygala**

Atroxima Stapf

Stapf: 85 (1905); Exell: 218 (1932); Exell & Mendonça: 88 (1937/1951); Petit: 284 (1958); Breteler & Smissaert-Houwing: 14 (1977); Breteler & Smissaert-Houwing: 589, 590 (1979).

Carpolobia G.Don, in part; Oliver: 136 (1868).

Shrubs or woody climbers; branches, branchlets and leaves ± glabrous. **Leaves** alternate, petiolate, entire, coriaceous, elliptic-oblong, prominently reticulate on both surfaces; stipules absent or gland-like. **Inflorescences** usually long, slender, axillary racemes, rarely panicles, glabrous or pubescent; bracts and bracteoles small, long-persistent. **Flowers** irregular; pedicel usually slightly twisted so that keel petal is not in a strictly abaxial position. **Sepals** 5, free, caducous, similar in shape but interior ones larger. **Petals** 5, subequal, lanceolate, adnate to staminal tube below. **Stamens** 5; filaments partly to ± entirely fused into a sheath. **Ovary** 3-locular with 1 ovule per locule; style filiform; stigma punctiform. **Fruit** hard and dry, subglobose, crustaceous. **Seeds** usually 3, finely hairy; endosperm 0.

Species 2, W and C Africa; sthn trop. Afr. 2, Angola.

Carpolobia G.Don

Don: 349, 370 (1831); Exell & Mendonça: 88 (1937/1951); Petit: 281 (1958); Exell: 304 (1960); White: 184 (1962); Exell: 141 (1970); Breteler & Smissaert-Houwing: 22 (1977); Coates Palgrave: 459 (2002).

Shrubs or trees; branchlets at first pubescent, becoming glabrous. **Leaves** alternate, shortly petiolate, ovate or obovate, lanceolate, elliptic or narrowly elliptic; stipules absent or small and gland-like or conical. **Flowers** irregular, in very short axillary racemes with pubescent rachis; pedicels usually twisted so that keel petal is not in a strictly abaxial position; bracts and bracteoles small, deltoid, usually long persistent. **Sepals** 5, free, 2 inner ones slightly larger. **Petals** 5, subequal in length, slightly or strongly unequal in shape, when strongly unequal then median petal concave-galeate, ciliate on margin, basal parts joined to staminal sheath; keel with appendage. **Stamens** (4)5; basal $^1/_2$–$^3/_4$ of filaments united into a sheath open at adaxial side; staminodes 0–3; anthers opening by 2 apical valves. **Ovary** (2)3-locular with 1 pendulous ovule per locule; stigma small, capitate. **Fruit** a drupaceous, subglobose berry, ± 10 mm in diam. **Seeds** 1–3, ellipsoid, flattened, with dense, long, silky hairs; endosperm copious; cotyledons foliaceous.

Species 4, Madagascar and trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Mozambique.

Muraltia DC.

Exell: 307 (1960); Binns: 87 (1968); Mapaura (Unpublished).

Sthn trop. Afr. 1: *Muraltia flanaganii* Bolus, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Polygala L.

Exell & Mendonça: 90, 363 (1937/1951); Exell: 307 (1960); Exell: 141 (1970); Paiva: 137 (1998); White *et al.*: 435 (2001); Coates Palgrave: 457 (2002); Izidine & Bandeira: 52 (2002); Lebrun & Stork: 190 (2003).

Sthn trop. Afr. 78, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Securidaca L.

Exell & Mendonça: 89 (1937/1951); Exell: 304 (1960); White: 184 (1962); Johnson: 5 (1987); Bingham & Smith: 143 (2002); Coates Palgrave: 458 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Polygonaceae

(Caryophyllidae—Polygonales)
(Core Eudicots—Caryophyllales)

Germishuizen, G. in Leistner: 451 (2000).

Sthn trop. Afr.: genera 7, species ± 46.

Additional family characters: High-climbing woody lianes with lateral branchlets ending in tendrils.
Identification of additional genus: **Brunnichia** differs conspicuously in its habit: high-climbing woody liana with tendrils.

Brunnichia Banks ex Gaertn.

Gaertner: 213 (1788); Hiern: 905 (1900); Baker & Wright: 119 (1909); Brandbyge: 540 (1993).

Afrobrunnichia Hutch. & Dalziel: 118 (1927); Hutchinson & Dalziel: 28 (1928); Robyns: 424 (1948); Cavaco: 5 (1963).

Woody, high-climbing vines with short lateral branches ending in tendrils; axillary buds 2, one forming a lateral branch, the other suppressed or forming a densely flowered inflorescence. **Leaves** elliptic, rounded to shortly cuneate at base, glabrous. **Flowers** bisexual; stipe much longer than short pedicel; floral tube and stipe 3-ridged. **Stamens** usually 8, exserted. **Ovary** swollen; styles 3. **Fruit** a triquetrous nut with 1 or 2 of the ridges expanded into flattened, leathery wings, enclosed in persistent accrescent floral tube. **Seed** triquetrous, deeply longitudinally 3-furrowed; endosperm irregularly ruminate.

Species 3, 1 in SC United States, 2 in trop. Africa; sthn trop. Afr. 1: *Brunnichia africana* Welw., Angola.

*Emex Cambd.

Graham: 3 (1958); Binns: 88 (1968); Mapaura (Unpublished).

Sthn trop. Afr. 1: **Emex australis* Steinh., introduced weed; also in sthn Afr.

*Fagopyrum Mill.

Graham: 25 (1958).

Sthn trop. Afr. 1: **Fagopyrum esculentum* Moench, escape from cultivation; also in sthn Afr.

Oxygonum Burch. ex Campd.

Hiern: 902 (1900); Dammer: 231 (1903); Baker & Wright: 99 (1909); Milne-Redhead: t. 3216 (1935); Robyns: 401 (1948); Graham: 145 (1957a); Graham: 236 (1957b); Graham: 26 (1958); Binns: 88 (1968); Brylska & Lisowski: 551 (1988); Brandbyge: 541 (1993); Ortiz & Paiva: 167 (1999).

Species ± 30, tropical and southern Africa; sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Persicaria (L.) Mill.

Wilson: 621 (1990); Brandbyge: 542 (1993); Ekman& Knutsson: 23 (1994); Ortiz & Paiva: 168 (1999).

Polygonum L., in part; Baker & Wright: 103 (1909); Binns: 88 (1968).

Sthn trop. Afr. ± 7, including naturalised species, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Polygonum L.

Dammer: 230 (1903); Baker & Wright: 103 (1909); Graham: 11 (1958);

Brandbyge: 542 (1993); Lebrun & Stork: 282 (2003); Mapaura (Unpublished).

Sthn trop. Afr. ± 8, including naturalised species, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rumex L.

Baker & Wright: 114 (1909); Rechinger: 1 (1954); Graham: 5 (1958); Binns: 88 (1968); Brandbyge: 541 (1993); Mapaura (Unpublished).

Sthn trop. Afr. 8, including naturalised species, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

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Portulacaceae

(Caryophyllidae—Caryophyllales)
(Core Eudicots—Caryophyllales)

Jordaan, M. in Leistner: 453 (2000).

Sthn trop. Afr.: genera 6, species 19.

Anacampseros L.

Percy-Lancaster & Richards: 76 (1992); Rowley: 105 (1994); Gerbaulet & Struck: 359 (1995); Steffens: 12 (1995); Rowley: 372 (2002).

Sthn trop. Afr. 1: *Anacampseros subnuda* Poelln., Zimbabwe, and sthn Afr.

Avonia (E.Mey. ex Fenzl) G.D.Rowley

Rowley: 105 (1994); Gerbaulet & Struck: 359 (1995); Steffens: 14 (1995); Rowley: 376 (2002).

Anacampseros L. subgen. *Avonia* E.Mey. ex Fenzl; Wild: 367 (1961); Percy-Lancaster & Richards: 76 (1992). *Anacampseros* L. subgen. *Anacampseros* sect. *Avonia*; Gerbaulet & Struck: 359 (1995).

Sthn trop. Afr. 1: *Avonia rhodesica* (N.E.Br.) G.D.Rowley, Zimbabwe, and sthn Afr. Gerbaulet & Struck (1995) reject the classification of Rowley (1994) and reinstate *Avonia* as a section under *Anacampseros*.

Ceraria H.Pearson & Stephens

Exell & Mendonça: 369 (1937/1951); Nyananyo & Olowokudejo: 775 (1986); Rowley: 378 (2002).

Sthn trop. Afr. 1: *Ceraria carrissoana* Exell & Mendonça, Angola, and sthn Afr.

Portulaca L.

Exell & Mendonça: 114, 368 (1937/1951); Wild & Diniz: 1 (1973); Percy-Lancaster & Richards: 76 (1992); Smith *et al.*: 139 (1997); Gilbert & Phillips: 769 (2000); Eggli: 400 (2002); Phillips: 2 (2002).

Sedopsis (Engl.) Exell & Mendonça: 116, 369 (1937/1951).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Portulacaria Jacq.

Coates Palgrave: 201 (2002); Phillips: 37 (2002).

Sthn trop. Afr. 1: *Portulacaria afra* Jacq., Mozambique.

Talinum Adans.

Exell & Mendonça: 113 (1937/1951); Wild: 369 (1961); Wild & Diniz: 7 (1973); Percy-Lancaster & Richards: 76 (1992); Eggli: 425 (2002); Phillips: 28 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Primulaceae

(Dilleniidae—Primulales)
(Asterids—Ericales)

Glen, H.F. in Leistner: 456 (2000).

Sthn trop. Afr.: genera 4, species 17. A family of some 22 genera and 500 species with almost world-wide distribution but found chiefly in north temperate regions.

Key to genera

[after Kupicha (1983)]

1a Ovary semi-inferior; staminodes present; pedicels with bract arising at or near the middle, thus geniculate ..... **Samolus**

1b Ovary superior; staminodes 0; pedicels with bract (or leaf) at base, not geniculate:

2a Plants pilose; leaves lobate-dentate; flowers borne in short extra-axillary, few-flowered racemes ..... **Ardisiandra**

2b Plants glabrous; leaves entire; flower solitary, axillary, usually arranged in racemes or spikes:

3a Capsule valvate; robust perennials ..... **Lysimachia**

3b Capsule circumscissile or rarely indehiscent; small, relatively slender annual and perennial herbs ..... **Anagallis**

Anagallis L.

Hess: 213 (1953); Taylor: 321 (1955); Taylor: 9 (1958b); Hiern: 635 (1898); Kupicha: 189 (1983); Glen, 929 (2003) under Theophrastaceae.

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique and sthn Afr.

Ardisiandra Hook.f.

Hooker: 205 (1864); Taylor: 146 (1958a); Kupicha: 184 (1983).

Pilose creeping perennial herbs with leafy stems. **Leaves** alternate, orbicular, coarsely 5–9-lobed and toothed, petiolate. **Flowers** in few-flowered, extra-axillary, short-peduncled racemes, pedicellate and bracteate, inconspicuous. **Calyx**: segments 5, free or somewhat accrescent, persistent. **Corolla** campanulate, with 5 lobes ± as long as corolla. **Stamens** 5, opposite petals; filaments short, connate below into a continuous ring fused at base to corolla tube; anthers apiculate. **Ovary** multi-ovulate. **Capsule** globose, dehiscent by 5 apical valves or indehiscent, many-seeded; seeds angular, blackish, papillose.

Species 3, endemic to the mountains of trop. Africa; sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique.

Lysimachia L.

Taylor: 142 (1958a); Kupicha: 187 (1983).

Sthn trop. Afr. 1: *Lysimachia ruhmeriana* Vatke, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Samolus L.

Hiern: 637 (1898); Taylor: 17 (1958b); Kupicha: 196 (1983).

Sthn trop. Afr. 1: *Samolus valerandi* L., Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

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Proteaceae
(Rosidae—Proteales)
(Eudicots—Proteales)

Rourke, J.P. in Leistner: 457 (2000).

Sthn trop. Afr.: genera 4, species 34.

Faurea Harv.

Burtt Davy *et al.*: 80 (1958); White: 36 (1962); Marner: 427 (1989); Marner: 2 (1993); Marner: 436 (2001); Coates Palgrave: 159 (2002); Lebrun & Stork: 396 (2003).

Species 15, Africa and Madagascar; sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Grevillea R.Br. ex Knight

Coates Palgrave: 156 (2002).

**Grevillea robusta* A.Cunn., originally from Australia, is an invader in parts of Zimbabwe; also in sthn Afr.

Leucospermum R.Br.

Burtt Davy *et al.*: 81 (1958); Rourke: 19 (1972).

Sthn trop. Afr. 1: *Leucospermum saxosum* S.Moore, Zimbabwe, Mozambique. Main distribution in sthn Afr.

Protea L.

White: 37 (1962); Beard: 138 (1963); Chisumpa & Brummitt: 815 (1987); Beard: 30 (1993); Brummitt: 8 (1993); White *et al.*: 438 (2001); Bingham & Smith: 143 (2002); Coates Palgrave: 162 (2002); Mapaura & Timberlake: 168 (2002); Lebrun & Stork: 396 (2003).

Sthn trop. Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Ptaeroxylaceae
(Rosidae—Sapindales)
(Eurosids II—Sapindales; under Rutaceae)

Archer, R.H. in Leistner: 461 (2000).

Sthn trop. Afr.: genus 1, species 1.

Ptaeroxylon Eckl. & Zeyh.

Exell & Mendonça: 306 (1951) (under Meliaceae); White & Styles: 548 (1966); White *et al.*: 1 (1969); White: 139 (1990); Coates Palgrave: 658 (2002);Victor *et al.*: 851 (2003).

Monotypic genus: *Ptaeroxylon obliquum* (Thunb.) Radlk.; sthn trop. Afr., Angola, Zimbabwe, Mozambique, and sthn Afr.

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Rafflesiaceae
(Magnoliidae—Aristolochiales)
(Unplaced)

Jordaan, M. in Leistner: 462 (2000).

Sthn trop. Afr.: genus 1, species 1.

Additional family characters: Flowering buds emerging through bark of younger branches of members of Caesalpinioideae (Fabaceae); flowers many, not arranged in distinct groups or inflorescences.

Berlinianche (Harms) Vattimo-Gil

Vattimo-Gil: 212 (1955); Vattimo-Gil: 51 (1971); Meijer: 561 (1993); Stannard: 14 (1997); Verdcourt: 1 (1998).

Pilostyles Guill., in part; Hiern: 908 (1900).

Small parasites of trees in family Fabaceae (Leguminosae), vegetatively much reduced, only flowers emerging on smaller branches of host. **Flowers** many, involucrate, globose, ovoid or ellipsoid, unisexual by abortion. **Perianth** segments 4–12, free, similar to bracts, imbricate, persistent, enclosing an annular disc at base. **Male flowers**: stamen filaments connate into a tube about a central column (pistillode); pistillode (and gynandroecial column) expanded apically into a disc (pileus) fringed with papillae; anthers sessile, 1–several-seriate below pileus rim. **Female flowers**: ovary inferior, surmounted by a fleshy disc; disc flat, concave or convex, sometimes appearing as a simple extension of style; style short, thick, conical or cylindrical; stigma capitate, stigmatic surface hemispherical or a subapical annular ring. **Berry** globose, surrounded by persistent bracts and perianth segments.

Species 2, confined to trop. Africa; sthn trop. Afr. 1: *Berlinianche aethiopica* (Welw.) Vattimo-Gil, Angola, Zambia, Zimbabwe, Malawi.

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Ranunculaceae
(Magnoliidae—Ranunculales)
(Eudicots—Ranunculales)

Dreyer, L.L. & Jordaan, M. in Leistner: 463 (2000).

Sthn trop. Afr.: genera 5, species 21.

Expanded family description: **Flowers** irregular, with clearly distinct calyx and corolla. **Sepals**: posterior one spurred. **Petals**: 2 posterior ones spurred.

Identification of additional genus: **Delphinium**: 2 posterior petals with spurs; the only zygomorphic representative in the region.

Clematis L.

Exell & Mendonça: 1, 353 (1937/1951); Milne-Redhead & Turrill: 1 (1952); Exell & Milne-Redhead: 89 (1960); Exell: 139 (1970); Exell *et al.*: 2 (1973); Brummitt: 97 (2000); White *et al.*: 441 (2001).

Clematopsis Bojer ex Hutch.; Exell & Mendonça: 4, 353 (1937/1951); Exell & Milne-Redhead: 93 (1960); Exell *et al.*: 6 (1973).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Delphinium L.

Linnaeus: 530 (1753); Linnaeus: 236 (1754); Milne-Redhead & Turrill: 19 (1952); Exell & Milne-Redhead: 101 (1960); Munz: 30 (1967); Exell: 139 (1970); Exell *et al.*: 14 (1973); Johnson: 599 (2002); Lebrun & Stork: 90 (2003).

Perennial herbs, erect; stems ± pubescent. **Leaves** mostly ± basal, palmatisect, often almost to base, palmatinerved; petioles long. **Flowers** bisexual, irregular, in terminal, racemose or paniculate inflorescences. **Sepals** 5, petaloid, posterior one produced into a spur. **Petals** 2–5, 2 posterior ones with spurs ± joined and fitting into calyx spur. **Stamens** many, often with flattened filaments. **Carpels** 3(4), sessile; ovules many. **Fruit** of 3 pubescent follicles.

Species ± 320, mostly N temperate, also trop. African mountains; sthn trop. Afr. 3, Zambia, Malawi, Mozambique.

Knowltonia Salisb.

Exell & Milne-Redhead: 97 (1960); Exell *et al.*: 10 (1973); Rasmussen: 1 (1979).

Sthn trop. Afr. 1: *Knowltonia transvaalensis* Szyszyl., Zimbabwe, Malawi,

Mozambique, and sthn Afr.

Ranunculus L.

Exell & Mendonça: 7, 353 (1937/1951); Milne-Redhead & Turrill: 13 (1952); Exell & Milne-Redhead: 97 (1960); Exell *et al.*: 12 (1973).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Thalictrum L.

Exell & Milne-Redhead: 96 (1960); Exell: 139 (1970); Exell *et al.*: 9 (1973).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Resedaceae

(Dilleniidae—Capparidales)
(Eurosids II—Brassicales)

Jordaan, M. in Leistner: 464 (2000).

Sthn trop. Afr.: genera 2, species 2.

Additional family characters and characters diagnostic for *Caylusea*: Carpels free almost to base, each with 2 or 3 basal ovules; fruit composed of 5 or 6 follicles connate at base only.

Caylusea A.St.-Hil.

Saint-Hilaire: 29 (1837); Elffers & Taylor: 1 (1958); Abdallah: 36 (1967).

Erect to ascending annuals to biennials, occasionally bushy; stem simple or branched, striate, glabrous or often scabrous to sparsely hairy on angles, especially towards inflorescence. **Leaves** scattered or fasciculate, sessile, entire, linear or lanceolate, scabrid on nerves and margins, occasionally undulate. **Inflorescence** dense, spike-like terminal raceme; bracts linear-subulate, persistent; pedicels slightly shorter than bracts but elongating considerably in fruit. **Flowers** bisexual or rarely unisexual, usually irregular. **Calyx** 5-partite; sepals subequal, persistent. **Petals** 5, deciduous, arising at base of disc, dilated at base of limb into a membranous suborbicular appendage; 2 adaxial petals deeply 4- or 5-fid, 3 abaxial ones entire or 2-fid. **Stamens** 10–15, arising on disc; filaments papillose; anthers 2-thecous, dehiscing longitudinally. **Ovary** superior, stipitate, of 5 or 6 whorled carpels connate at base; ovules many, clustered at base of carpels. **Fruit** of open follicles spreading stellately, 7–12-seeded. **Seeds** kidney-shaped, sinus narrow, filled with carunculate tissue, rugulose with small rounded warts.

Species 4, Cape Verde Islands, N and E Africa; sthn trop. Afr. 1: *Caylusea abyssinica* (Fresen.) Fisch. & C.A.Mey., Malawi.

*Reseda L.

Taylor: 245 (1960); Abdallah: 99 (1978).

Sthn trop. Afr. 1: **Reseda odorata* L., Zimbabwe, and sthn Afr.; widely cultivated and often naturalised.

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Rhamnaceae

(Rosidae—Rhamnales)
(Eurosids I—Rosales)

Bredenkamp, C.L. in Leistner: 465 (2000).

Sthn trop. Afr.: genera 11, species 27.

Key to genera

[partly after Johnston (1972) and Drummond (1966)]

1a Leaves distinctly opposite; stipules mostly interpetiolar ..... **Lasiodiscus**
1b Leaves alternate or subopposite to opposite, but then stipules not interpetiolar:
2a Petioles ± 2 mm long; leaf blades 10–20 mm long, linear-lanceolate; somewhat heath-like shrubs with stiff ascending leafy branches ..... **Phylica**
2b Petioles longer than 2 mm; leaf blades usually longer than 20 mm and not linear-lanceolate:
3a Plants armed with stipular or axillary spines:
4a Leaves penninerved; spines not stipular ..... **Scutia**
4b Leaves 3–5-nerved from the base; branches often with stipular spines ..... **Ziziphus**
3b Plants unarmed or branches spine-tipped:
5a Climbing shrubs or lianes with coiled tendrils; ovary and fruit completely inferior:
6a Leaves toothed; mature fruits 3-winged before dehiscence ..... **Gouania**
6b Leaves entire; fruit not winged ..... **Helinus**
5b Shrubs or trees, or if lianes or scandent, then without coiled tendrils:
7a Fruit a fleshy drupe:
8a Leaves 3–5-nerved from the base ..... **Ziziphus**
8b Leaves penninerved:
9a Ovary and fruit apparently 1-locular; style simple, expanded at the top into a peltate stigma usually marked by furrows into 4(5) portions each bearing 2 minute tooth-like lobes ..... **Maesopsis**
9b Ovary and fruit 2–4-locular; style various not expanded at the top:
10a Ovary and fruit 2-locular; leaves entire with veins forming a regular herring-bone pattern; style thick, conical, 2-lobed; flowers 5-merous ..... **Berchemia**
10b Ovary and fruit 2–4-locular; leaves usually serrate or crenate, if entire then flowers 4-merous; veins on leaves less regular than above; styles 2–4, free or united, ± filiform ..... **Rhamnus**
7b Fruit a capsule or winged and samara-like:
11a Fruit a capsule breaking up into 3(4) 1-seeded mericarps; leaves 3–5-veined at the base with middle vein with several lateral veins ..... **Colubrina**
11b Fruit samara-like with a 1-locular, 1-seeded ± spherical body bearing a linear-oblong terminal wing; leaves pinnately nerved .. **Ventilago**

Berchemia Neck. ex DC.

Exell: 226 (1932); Drummond: 424 (1966); Drummond & Torre: 8 (1973); Coates Palgrave: 668 (2002).

Phyllogeiton (Weberb.) Herzog, Exell & Mendonça: 30 (1954/1956).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Colubrina Rich. ex Brongn.

Drummond: 430 (1966); Johnston: 2 (1971); Drummond & Torre: 13 (1973); Coates Palgrave: 672 (2002).

Sthn trop. Afr. 1: *Colubrina asiatica* (L.) Brongn., strand plants in Mozambique, and sthn Afr.

Gouania Jacq.

Jacquin: 263 (1763); Exell & Mendonça: 32 (1954/1956); Evrard: 447 (1960); Drummond: 434 (1966); Drummond & Torre: 15 (1973); White *et al.*: 443 (2001).

Climbing shrubs or lianes; branches provided with coiled tendrils, pubescent, glabrescent later. **Leaves** alternate, petiolate; lamina ovate, entire or dentate, penninerved but often 3–5-nerved from base; stipules small, caducous. **Inflorescence** a paniculate thyrse. **Flowers** usually bisexual. **Sepals** 5. **Petals** 5, cucullate; inserted below margin of disc. **Stamens** 5. **Disc** filling receptacle, 5-lobed. **Ovary** inferior, immersed in disc; style 3-fid or obscurely 3-lobed. **Fruit** a schizocarp, longitudinally 3-winged (or 3-angled), septicidal, separating into 3 woody or coriaceous, indehiscent cocci. **Seeds** compressed or planoconvex.

Species 50–70, tropical and warm Old and New World; sthn trop. Afr. 3, Angola, Zimbabwe, Malawi, Mozambique.

Helinus E.Mey. ex Endl.

Exell & Mendonça: 31 (1954/1956); Drummond: 435 (1966); Drummond & Torre: 17 (1973).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Lasiodiscus Hook.f.

Drummond: 438 (1966); Drummond & Torre: 19 (1973); Figueiredo: 495 (1995); White *et al.*: 443 (2001); Coates Palgrave: 675 (2002).

Sthn trop. Afr. 3, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Maesopsis Engl.

Engler: 255 (1895); Exell & Mendonça: 29 (1954/1956); Hallé: 51 (1962); Johnston: 36 (1972).

Tall trees; bark silvery grey with vertical, twisted furrowing. **Leaves** opposite to somewhat alternate, petiolate, ovate-elliptic to oblong-ovate, penninerved with many subparallel tertiary veins, markedly glandular-serrulate; stipules subulate, caducous. **Inflorescences** divaricately branched axillary cymes. **Flowers** bisexual. **Sepals** 5, deltoid with minutely pubescent margins. **Petals** 5, not clawed, extremely concavo-convex and thus almost totally obscuring anther, even when dehiscing. **Stamens** 5, with ± sessile anthers. **Disc** thin, lining cup at its rim, minutely 10-lobed. **Ovary** apparently 1-locular, with a single basal, ascending, anatropous ovule; style simple, cylindric, projecting only slightly above petals; stigma peltate with 10 small marginal lobes. **Fruit** a ± obovoid drupe with a 1-seeded stone with style and stigma persistent; outer portion of mesocarp fleshy.

Monotypic genus: *Maesopsis eminii* Engl., trop. Africa; sthn trop. Afr.: Angola, Zambia. Considered a dangerous invader in E Usambara, Tanzania (Binggeli & Hamilton 1993).

Phylica L.

Drummond: 430 (1966); Drummond & Torre: 14 (1973); Richardson *et al.*: 405 (2001); White *et al.*: 445 (2001); Coates Palgrave: 673 (2002); Phiri (Unpublished).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rhamnus L.

Exell & Mendonça: 31 (1954/1956); Drummond: 427 (1966); Drummond & Torre: 10 (1973); Retief: t. 2030 (1990); White *et al.*: 445 (2001); Coates Palgrave: 670 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Scutia (DC.) Brongn.

Drummond: 428 (1966); Drummond & Torre: 11 (1973); Johnston: 64 (1974); White *et al.*: 446 (2001); Coates Palgrave: 669 (2002).

Sthn trop. Afr. 1: *Scutia myrtina* (Burm.f.) Kurz, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ventilago Gaertn.

Exell & Mendonça: 32 (1954/1956); Hallé: 56 (1962); Johnston: 34 (1972); Dowsett-Lemaire & White: 81 (1990); White *et al.*: 446 (2001).

Stout lianes up to 30 m long; branches somewhat zig-zag. **Leaves** alternate, petiolate, ovate-lanceolate or nearly ovate, denticulate, ± glabrous, penninerved with many, sub-parallel tertiary nerves; stipules minute, caducous. **Inflorescences** usually very densely crowded axillary cymes appearing like nodal glomerules. **Flowers** bisexual. **Sepals** 5, deltoid. **Petals** 5, usually clawed, concave and cucullate. **Disc** ± pentagonal or 5-lobed, thick, adnate to lower half of ovary, later somewhat accrescent. **Stamens** 5, adnate to base of petals; connective projecting beyond anthers. **Ovary** half-inferior, 2-locular, but one locule often sterile, with 1 basal ovule per locule; style short, 2-branched. **Fruit** dry, samara-like consisting of a basal 1-locular ± spherical body and a strap-like wing up to ± 60 mm long and 10 mm wide, ending in 2 minute persistent styles. **Seed** without endosperm; cotyledons fleshy.

Species 35, Old World tropics; sthn trop. Afr. 2, Angola, Malawi.

Ziziphus Mill.

Exell & Mendonça: 28 (1954/1956); White: 228 (1962); Drummond: 419 (1966); Drummond & Torre: 2 (1973); Killick: t. 1739 (1977); Coates Palgrave: 665 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Rhizophoraceae

(Rosidae—Rhizophorales)
(Eurosids I—Malpighiales)

Bredenkamp, C.L. in Leistner: 468 (2000). See also: Dahlgren: 1259 (1988); Takhtajan: 280 (1997); Angiosperm Phylogeny Group: 419 (2003).

Sthn trop. Afr.: genera 5, species 21.

Additional family characters: **Stamens** with filaments fused into a long tube. **Fruit** a 5-locular capsule with 2 seeds per locule.

Identification of additional genus using the key in the above Bredenkamp reference: **Anopyxis** will run to *Cassipourea* from which it can distinguished by the filaments fused into a long tube and by the 5-locular capsule with 2 seeds per locule.

Anopyxis (Pierre) Engl.

Engler: 48 (1900); Sprague & Boodle: 309 (1909); Keay: 286 (1954); Mendes: 36 (1970).

Large trees; branches glabrous. **Leaves** in 3- or 4-nate verticils, oblong to oblong-lanceolate, rounded at apex, subcoriaceous, glabrous, shiny, finely reticulate; stipules interpetiolar, linear. **Inflorescences** axillary, short cymes. **Calyx** broadly campanulate, softly tomentellous; lobes 5, ovate, obtuse, longer than fused basal part. **Petals** 5, free, linear-oblanceolate, entire or toothed, pubescent in upper part. **Stamens** 10, monadelphous; staminal tube cylindric, 10-crenulate at apex; anthers sessile between crenulations. **Ovary** 5-locular, sessile, depressed-globose, with 2 collateral, pendent ovules per locule. **Fruit** a 5-locular, loculicidal capsule, narrowly ovoid to ellipsoid, softly tomentellous. **Seeds** 2 per locule, winged in upper part with a membranous aril.

Species 2 or 3, trop. Africa; sthn trop. Afr. 1: *Anopyxis klaineana* (Pierre) Engl., Angola (Cabinda).

Bruguiera Savigny

Lewis: 6 (1956); Torre & Gonçalves: 87 (1978); Gonçalves & Torre: 19 (1979); Coates Palgrave: 785 (2002).

Sthn trop. Afr. 1: *Bruguiera gymnorrhiza* (L.) Lam., Mozambique, and sthn Afr.

Cassipourea Aubl.

Exell: 162 (1928); White: 275 (1962); Mendes: 36 (1970); Torre & Gonçalves: 89 (1978); Gonçalves & Torre: 2 (1979); White *et al.*: 447 (2001); Bingham & Smith: 143 (2002); Coates Palgrave: 785 (2002); Izidine & Bandeira: 52 (2002).

Weihea Spreng.; White: 276 (1962) as synonym.

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ceriops Arn.

Lewis: 5 (1956); Torre & Gonçalves: 84 (1978); Gonçalves & Torre: 14 (1979).

Sthn trop. Afr. 1: *Ceriops tagal* (Perr.) C.B.Rob., Mozambique, and sthn Afr.

Rhizophora L.

Lewis: 2 (1956); Mendes: 34 (1970); Torre & Gonçalves: 82 (1978); Gonçalves & Torre: 16 (1979); Coates Palgrave: 784 (2002).

Sthn trop. Afr. 4, Angola, Mozambique, and sthn Afr.

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Rosaceae
(Rosidae—Rosales)
(Eurosids I—Rosales)

Jordaan, M. in Leistner: 470 (2000).
Mendes (1970); Mendes (1978).

Sthn trop. Afr.: genera 8, species 25.

Identification of additional genus: **Hagenia** will run to *Leucosidea* from which it can be distinguished by the 10–17 (not 5–7) leaflets per leaf; and the drooping panicles (not erect racemes).

Agrimonia L.

Mendes: 27 (1978).

Sthn trop. Afr. 1: *Agrimonia bracteata* E.Mey. ex C.A.Mey, Zimbabwe, and sthn Afr.

Alchemilla L.

Mendes: 29 (1978); Letouzey: 196 (1978); Mendes: 17 (1981).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cliffortia L.

White: 68 (1962); Mendes: 4 (1970); Mendes: 24 (1978); Mendes: 13 (1981); White *et al.*: 451 (2001); Coates Palgrave: 246 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, but most species confined to sthn Afr.

*Cotoneaster Medik.

Coates Palgrave: 250 (2002).

**Cotoneaster franchetii* Boiss. and **C. pannosus* Franch. are naturalised in Zimbabwe, and in sthn Afr.

Hagenia J.F.Gmel.

Gmelin: 600, 613 (1791); White: 68 (1962); Mendes: 20 (1978); White *et al.*: 451 (2001).

Dioecious or polygamo-dioecious trees; branchlets ringed by scars of fallen leaf bases. **Leaves** imparipinnate, crowded; leaflets 5–7(8) on each side, subopposite, sessile or almost so, narrowly oblong; stipules large, adnate to base of petiole, sheathing branchlets. **Inflorescence**: large, terminal, drooping panicles. **Flowers** with 2 or 3 bracts embracing base of calyx tube. **Calyx**: tube with (4)5 'epicalyx'-lobes alternating with and inserted below (4)5 calyx lobes; calyx lobes in male flowers larger than epicalyx, in female and bisexual flowers smaller than epicalyx. **Petals** (4)5, alternating with calyx lobes, or 0. **Stamens** up to 20, inserted on annular hairy disc lining mouth of calyx tube. **Gynoecium** of (1)2 carpels free within receptacle; styles (1)2, terminal; stigmas asymmetrically discoid; ovule single, pendulous. **Fruit**: 1-seeded achene with fragile pericarp.

Monospecific upland genus from NE Africa: *Hagenia abyssinica* (Bruce) J.F.Gmel.; sthn trop. Afr.: Zambia, Malawi.

Leucosidea Eckl. & Zeyh.

Mendes: 22 (1978); Mendes: 11 (1981); Coates Palgrave: 245 (2002).

Monotypic genus: *Leucosidea sericea* Eckl. & Zeyh.; sthn trop. Afr.: Zimbabwe, Mozambique, and sthn Afr.

Prunus L.

Mendes: 1 (1970); Mendes: 10 (1978); Mendes: 2 (1981); White *et al.*: 452 (2001); Coates Palgrave: 249 (2002); Dombo *et al.*: 10 (2002).

Pygeum Gaertn.; Burtt Davy *et al.*: 84 (1958).

Sthn trop. Afr. 1: *Prunus africana* (Hook.f.) Kalkman, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. **Prunus cerasoides* D.Don from the Himalayan region and **P. serotina* Ehrh., originally from the USA have become naturalised in eastern Zimbabwe and elsewhere [Coates Palgrave: 250 (2002)].

Rubus L.

Mendes: 2 (1970); Kupicha: 12 (1978); Kupicha: 4 (1981); White *et al.*: 454 (2001).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Rubiaceae

(Asteridae—Rubiales)
(Euasterids I—Gentianales)

Retief, E. & Leistner, O.A. in Leistner: 476 (2000).

Main references consulted: *Flora zambesiaca* 5(1) & 5(2); *Flore du Gabon* 12 & 17; *Flora of tropical east* Africa: Rubiaceae (parts 1–3); *Flora of west tropical Africa*, edn 2, 2: 104–223.

White: 383 (1962); Lersten: 125 (1974); Puff: 1 (1986); Robbrecht & Puff: 63 (1986); Robbrecht: 1 (1988b); Robbrecht: 173 (1993); Andersson & Rova: 161 (1999); Lantz *et al.*: 173 (2002). The forthcoming volume of *Flora zambesiaca* could not be taken into account for this treatment.

Sthn trop. Afr.: genera 126, species 657.

Key to genera

[Genera comprising plants of different habit have been included in more than one key—adapted from Verdcourt & Bridson (1991) and Bridson (1998)]

1a Herbs or subshrubs (if climbing or scandent see Key 3); corolla lobes always valvate; raphides present, or if raphides absent and inflorescences clearly axillary, go to Key 2 ..... Key 1

1b Plants woody, or sometimes with ± herbaceous shoots from a woody rootstock (pyrophytes or geofrutices); corolla lobes valvate, contorted or sometimes imbricate; raphides present or absent:
2a Climbing and/or scandent plants ..... **Key 3**
2b Plants not climbing, but sometimes scrambling:
3a Plants subshrubby to shrubby, or occasionally with ± herbaceous shoots from a woody or rhizomatous rootstock, with the herbaceous shoots 0.1–2 m tall and mostly burnt off by annual fires (pyrophytes) ..... **Key 2**
3b Shrubs or trees (0.75)2–20 m tall ..... **Key 4**

Key 1—Herbaceous

1a Leaves and stipules similar, in whorls of 4–8; herbs and herbaceous climbers with ± rotate corollas; ovules solitary in each locule; fruits bilobed, indehiscent; plants often adhesive due to prickles and harsh hairs:
2a Petioles very well-developed, 10–80 mm long (in one species ± winged and difficult to tell from young leaf blades); corolla usually 5-merous ..... **Rubia**
2b Petioles very short or leaves sessile; corolla usually 4-merous ..... **Galium**
1b Leaves clearly different from the stipules, opposite, or less often in whorls of 3(5); corolla mostly clearly tubular:
3a Calyx with 5 free, showy, petal-like sepals ± as long as corolla tube; leaves markedly anisophyllous ..... **Pentaloncha**
3b Calyx lobes not showy and petal-like:
4a Leaf blades 100–340 mm long, densely felted underneath with cream-coloured hairs; stipules red, 30–40 mm long; ovary (2)3–5-locular with many ovules/seeds ..... **Stipularia**
4b Leaves and stipules smaller, if similar in size then ovules 1 per locule; if ovules/seeds many, then locules 2:
5a Ovules (or seeds) 2–many in each locule:
6a Corolla lobes very narrowly lanceolate and about as long as, or longer than, the corolla tube; stigma capitate; flowers not heterostylous, both style and stamens exserted; capsule often with 1 persistent valve and 1 falling valve; small shrubs and herbs without raphides ..... **Virectaria major** (K. Schum.) Verdc.
6b Corolla lobes usually not so narrow and often shorter than the tube; stigma usually bilobed; flowers often heterostylous, with either stamens or style included; capsule mostly opening at the beak; raphides present (usually easily visible in ovary or fruit wall):
7a Inflorescences consisting of very lax elongated cymes, axillary (lateral) but only one per node; flowers 5-merous and leaves uninerved; decumbent herbs of wet places with small white or blue flowers ..... **Pentodon**
7b Inflorescences not as above; if flowers 5-merous, then other characters not so combined:
8a Flowers mostly 4-merous; leaf blades frequently linear to narrowly elliptic and uninerved, or sometimes elliptic to ovate with lateral nerves ± discernible:
9a Flowers solitary, or fascicled at numerous nodes forming long interrupted spike-like inflorescences; leaves linear-subulate, rather sparse; corolla tube 1.5–2 mm long ..... **Manostachya**
9b Features not combined as above:
10a Beak of capsule as long as, or longer than, the rest of the capsule:
11a Robust subshrubby herbs with distinctly discolorous leaves; capsule rounded at the base ..... **Hedythyrsus**
11b Delicate herbs; leaves not distinctly discolorous; capsule cordate at the base ..... **Mitrasacmopsis**
10b Beak of capsule shorter than the rest of the capsule:
12a Corolla tube cylindric, at least 20 mm long; anthers included and style exserted; flowers not heterostylous .... **Conostomium**
12b Corolla tube cylindric or funnel-shaped, shorter than 20 mm (sometimes with included anthers and exserted style but then usually heterostylous), or if 20 mm long then with both anthers and stigmas included:
13a Anthers and stigmas included, the latter always overtopped by the former; corolla tube narrowly cylindric ... **Kohautia**
13b Anthers and/or stigmas exserted or if both included then anthers overtopped by the stigma; corolla tube cylindric or funnel-shaped:
14a Stems strict, erect, usually unbranched; leaves linear or filiform; stipule sheath tubular, truncate or with 2 minute teeth; seeds dorsiventrally flattened ..... **Amphiasma**
14b Stems lax or erect, mostly branched; leaves sometimes linear; stipular sheath scarcely tubular; seeds angular, subglobose or ovoid-trigonous:
15a Capsule with a thick bony wall and a solid beak, tardily dehiscent; prostrate perennial herbs often forming small mats ..... **Lelya**
15b Capsule with a thinner horny wall, with or without a beak but never solid, early dehiscent; plants upright or prostrate:
16a Capsule opening both septicidally and loculicidally; erect perennial herbs or subshrubs; inflorescences many-flowered, corymbose or subglobose heads; seeds ovoid-trigonous ..... **Agathisanthemum**
16b Capsule opening loculicidally; herbs annual or perennial, erect or prostrate, rarely subshrubby; inflorescences various but seldom many-flowered; seeds angular or subglobose ..... **Oldenlandia**
8b Flowers mostly 5-merous; leaf blades mostly elliptic to ovate with obvious lateral venation, but if uninerved then a decumbent subshrub:
17a Flowers solitary, paired or in axillary clusters:
18a Flowers solitary; corolla tube filiform, enlarged near apex; subshrub of rock crevices; leaves revolute ..... **Batopedina**
18b Flowers in several-flowered, sessile, pseudoaxillary clusters; corolla tube narrowly campanulate in upper half; procumbent perennial forest floor herbs ..... **Parapentas**

17b Flowers in more extensive inflorescences; habit of plants not as above; leaves larger, not revolute:
19a Inflorescences capitate, or lax, much branched compound cymes, not elongating into simple "spikes" in fruit, although individual branches sometimes become spicate; corolla usually without a showy eye, the bases of the lobes not connate; fruit globose or obpyramidal, less often ovoid-oblong ..... **Pentas**
19b Inflorescences capitate, later elongating into a long simple "spike", rarely with axillary spikes from the upper axils and frequently with solitary flowers at the lower nodes; corolla with a crimson hairy eye formed by the connate bases of corolla lobes; fruits oblong ..... **Otomeria**

5b Ovules (or seeds) solitary in each locule, or flowers male:
20a Style topped by a pollen presenter which is globose, cylindrical or mitriform and often ridged, 2–several-lobed at the apex when mature; flowers never heterostylous; inflorescences always axillary; fruit with 2–several woody pyrenes ..... Vanguerieae (go to Key 5)
20b Style lacking a pollen presenter; flowers frequently heterostylous; fruit occasionally with pyrenes (but then inflorescence terminal) or sometimes with one many-seeded stone (putamen):
21a Plants usually ericaceous (heath-like) in appearance, often dioecious; flowers unisexual, wind-pollinated; stigmas long and feathery; corolla markedly inconspicuous; disk absent; fruit dehiscing into 2 mericarps:
22a Inflorescence made up of axillary, ± sessile flower clusters; fruit supported by a carpophore ..... **Anthospermum**
22b Inflorescence terminal, paniculate to thyrso-paniculate; fruit never supported by a carpophore ..... **Galopina**
21b Plants generally not ericaceous in appearance; flowers hermaphrodite, insect-pollinated; stigmas not as above; corollas inconspicuous or moderately showy; disk present; fruit various:
23a Corolla tube filiform or narrowly funnel-shaped; calyx lobes unequal, 1 or more enlarged; flowers not heterostylous, both stamens and style exserted; ovary bicarpellate, but often with one carpel reduced in fruit ..... **Otiophora**
23b Corolla tube not markedly narrow; calyx lobes usually equal; flowers frequently heterostylous; ovary 2–5-locular; carpel reduction unusual in fruit:
24a Ovules pendulous from near apex of locule; fruit dry or somewhat fleshy, indehiscent or tardily splitting into cocci:
25a Slender erect annual herbs; corolla white:
26a Flowers 3-or 4-merous ..... **Paraknoxia**
26b Flowers 5-merous ..... **Neopentanisia**
25b Plants perennial, more robust herbs; corolla mostly blue:
27a Flowers in heads arranged in umbel-like inflorescences; flowers fused in pairs consisting of 1 calyx, 2 corollas and 2 fused ovaries, each 1-locular ..... **Calanda**
27b Flowers, if in heads, not arranged umbel-like; flowers not fused in pairs ..... **Pentanisia**
24b Ovules erect from the locule base, or attached near middle of the septum; fruit drupe-like, or dry and variously dehiscent:
28a Ovule erect from the locule base; flowers always terminal, often pedicellate; fruit drupe-like; creeping or sometimes shrubby herbs, often on forest floors:
29a Leaves seldom cordate at base; pyrenes not dehiscent; subshrubby herbs:
30a Flowers in heads surrounded by an involucre; endosperm not ruminate ..... **Trichostachys**
30b Flowers not in heads; endosperm ruminate or not ..... **Psychotria**
29b Leaves mostly cordate at base; pyrenes with a distinct line of dehiscence; endosperm not ruminate; usually small creeping herbs:
31a Stipules with a membranous sheath within; pyrenes smooth ..... **Hymenocoleus**
31b Stipules without a membranous sheath within; pyrenes ribbed, often rugose ..... **Geophila**
28b Ovule attached near middle of the septum; flowers sessile in axils, or in terminal heads; fruit dry (often splitting) or less often succulent; herbs or subshrubs, usually in open situations:
32a Ovary 3-locular; stigma 3-lobed; fruit with 3 cocci ..... ***Richardia**
32b Ovary 2-locular; stigmas 2-lobed or capitate; fruits indehiscent, capsular with 2 valves, with 2 cocci or circumscissile:
33a Fruit circumscissile about its middle, the top coming off like a lid; flowers in dense globose nodal clusters, minute (corolla tube up to 2 mm long); seeds with a ventral impressed X-like pattern ..... **Mitracarpus**
33b Fruit indehiscent or opening by longitudinal slits, or 2-coccous; flowers in axillary or terminal clusters, usually larger; seeds lacking an X-like pattern:
34a Succulent creeping plant of the seashore with imbricate leaves; stipules quite broad, sheathing, with very short processes; stems rooting at the nodes; fruits indehiscent; seeds not lobed ..... **Phylohydrax**
34b Plant not succulent, not growing on seashore but sometimes riverine; leaves not imbricate; stipules with longer processes; stems not rooting at the nodes; fruits dividing into cocci; seeds lobed:
35a Fruit with 2 indehiscent or ± indehiscent cocci ..... **Diodia**
35b Fruit opening from apex to base or base to apex, or splitting into 2 cocci, one or both dehiscent ... **Spermacoce**

Key 2—Perennial herbs, sometimes woody at base, with woody rootstock (pyrophytes or geofrutices)

1a Calyx tubes joined together; fruits fleshy, fused into syncarps; corolla lobes valvate; raphides present (especially in ovary and fruit walls) ..... **Morinda angolensis** (R.D.Good) F.White
1b Calyx tubes always free; fruit not compound; corolla lobes various; raphides present or absent:
2a Ovules (or seeds) few to numerous in each locule:
3a Corolla lobes valvate; flowers heterostylous; raphides present; capsules dehiscent; stipules fimbriate ..... **Pentas** (partly)

3b Corolla lobes contorted; flowers not heterostylous; raphides absent; fruit indehiscent; stipules not fimbriate:
4a Flowers clearly axillary in both axils; inflorescence fasciculate with cupular bracteoles; corolla tube shorter than 12 mm, ± equal to the lobes in length; fruit 5–15 mm in diameter:
5a Leaves suborbicular with subpalmate venation, petioles long, slender; flowers solitary; endemic in Angola ..... **Ganguelia**
5b Leaves distinctly longer than wide with pinnate venation; flowers mostly more than 1 per inflorescence:
6a Calyx limb 4–5 mm long, entire in bud, splitting into 2 or 3 lobes in mature flowers; anthers basifixed; fruit 10–15 mm across; linear bacterial nodules present on midrib and petioles ..... **Sericanthe suffruticosa** (Hutch.) Robbr.
6b Calyx limb not as above; anthers dorsifixed; fruit 6–8 mm across; bacterial nodules absent ..... **Tricalysia cacondensis** Hiern
4b Flowers terminal; inflorescence not as above; corolla tube mostly longer and exceeding the lobes; fruit mostly larger:
7a Flowers 1–3; corolla pubescent outside, lobes (4)5(6); seeds free, with a small excavation on the ventral face; stipules 6–16 mm long ..... **Leptactina** (partly)
7b Flowers solitary; corolla glabrous outside, lobes 5 or 6–8; seeds in a pulpy placenta, not excavated; stipules not longer than 7 mm ..... **Gardenia** (partly)

2b Ovules (or seeds) solitary in each locule:
8a Corolla lobes contorted; corolla tube distinctly longer than the lobes; flowers not heterostylous, anthers and style always exserted; raphides absent; seeds with excavation on ventral face; inflorescence terminal on leafless lateral branches (sometimes reduced or even entirely suppressed); bacterial nodules present in leaf blades ..... **Pavetta** (partly)
8b Corolla lobes valvate; corolla tube subequal or a little longer than the lobes, if longer, then usually bright blue; raphides absent or present; flowers often heterostylous; seeds not excavated; inflorescences terminal or axillary; bacterial nodules absent in leaf blades except for some species of *Psychotria*:
9a Flowers heterostylous; stigma bifid; pyrene walls cartilaginous to crustaceous; inflorescences terminal:
10a Corolla blue, white, lilac or purple; corolla tube longer than the lobes; ovules pendulous fruit ± dry ..... **Pentanisia schweinfurthii** Hiern
10b Corolla white; corolla tube ± equalling the lobes or a little longer; ovules erect; fruit fleshy:
11a Inflorescence axes not white; pyrenes without well-marked dehiscence; testa red-brown or purplish; endosperm often ruminate; stipules entire or bifid, often caducous, never becoming corky ..... **Psychotria** (partly)
11b Inflorescence axes white, tinged purple; pyrenes with ± well-marked dehiscence; testa pale; endosperm not ruminate; stipules ± truncate, often becoming corky ..... **Chassalia umbraticola** Vatke
9b Flowers not heterostylous; style topped with a pollen presenter which is globose, cylindric or mitriform, often ridged, 2–several-lobed at the apex when mature; pyrene-walls crustaceous to woody; inflorescences axillary:
12a Ovary 2-locular:
13a Corolla coriaceous, drying wrinkled, glabrous; buds obtuse; leaves glabrous, drying the characteristic yellow-green of an aluminium-accumulator; pyrenes very thickly woody, irregularly ridged with lines of dehiscence apparent ..... **Multidentia concrescens** (Bullock) Bridson & Verdc.
13b Corolla not coriaceous nor drying wrinkled; buds acuminate; leaves hairy or velvety, the blades not drying yellow-green; pyrenes not so thickly woody:
14a Small subshrub 0.15–0.3 m tall; calyx lobes narrowly oblong, elliptic or lanceolate, 0.8–5 mm long; leaves hairy beneath but not so densely as to hide the surface ..... **Pygmaeothamnus zeyheri** (Sond.) Robyns
14b Shrub or subshrub 0.6–5 m tall; calyx lobes linear, 1.5–4 mm long; leaves velvety beneath, surface obscured ..... **Rytigynia decussata** (K.Schum.) Robyns
12b Ovary 3–8-locular, a few flowers sometimes with 2-locular ovaries:
15a Corolla tube 17–25 mm long, sometimes curved, rusty tomentose outside; calyx lobes 5–13 mm long, lanceolate-triangular; fruit ± 14 mm across, with a rusty coloured velvety pubescence; leaf blades drying dark, with a fine network of pale yellowish nerves on upper surface and pale velvety beneath ..... **Ancylanthos rubiginosus** Desf.
15b Corolla tube much shorter; other characters not as combined above:
16a Plants glabrous to pubescent; leaf blades sometimes with fine white pubescence, finely velvety beneath or occasionally felted beneath (if in doubt try both leads):
17a Stems branched; leaf blades often acuminate at apex; calyx lobes reduced or dentate; corolla never large; lobes blunt, apiculate or distinctly tailed ..... **Rytigynia** (partly)
17b Stems mostly unbranched; leaf blades infrequently acuminate; calyx and corolla various:
18a Leaves mostly in whorls of 3–5; calyx limb truncate, dentate or lobed; corolla large or small, lobes blunt, apiculate or infrequently subulate (*F. chlorantha*) ..... **Fadogia**
18b Leaves in pairs, rarely in whorls of 3; calyx limb with linear or linear-oblong lobes; corolla small, lobes distinctly apiculate ..... **Pachystigma** (partly)
16b Plants with a conspicuous indumentum; leaf blades densely velvety or felted on lower surface:
19a Calyx lobes 0.5–1 mm long; calyx tube and corolla similarly covered by dense, pale, curled hairs; fruit ± 10 mm across, drying black, ± glabrous or with scattered cottony hairs; indumentum on young stems and lower surface of leaves especially densely felted; small shrubs 0.3–4 m tall, with branched stems ..... **Fadogiella**
19b Calyx lobes longer; calyx tube indumentum often differing in density and/or type from that on the corolla; fruit often larger, mostly yellow, orange or reddish becoming brownish when dry, often with golden velvety hairs; indumentum on stems and leaves mostly velvety but sometimes with curled hairs; branched shrubs or single-stemmed subshrubs ..... **Tapiphyllum** (partly)

Key 3—Climbing or scandent (herbaceous or woody)

1a Plants covered with curved prickles; leaves and stipules similar to each other, in whorls of (2)4(8); corolla rotate to subcampanulate; fruit fleshy, 2-seeded ..... **Rubia**

1b Plants not prickly but spines sometimes present; leaves usually paired, very different from stipules; corolla distinctly tubular:

2a Flowers showy, 1–several, appearing axillary on alternate sides of successive nodes; calyx lobes reddish, oblong-lanceolate, contorted in bud; corolla silky-pubescent outside; fruit large, up to 100 x 55 mm ..... **Sherbournia bignoniiflora** (Welw.) Hua

2b Flowers and inflorescences not as above, or if flowers showy then corolla not silky; fruit much smaller:

3a Plants foetid; leaves paired or in whorls of 3, long-petiolate and cordate at base; fruits flattened, outer pericarp falling off to expose 2 compressed, winged pyrenes attached by long filiform stalks ..... **Paederia**

3b Plants not evil-smelling; leaves not as above; fruit not of this characteristic structure:

4a Flowers in solitary, terminal or axillary, many-flowered, spherical heads; flowering branches with strongly curved hooked axillary spines ..... **Uncaria**

4b Combination of characters not as above:

5a Inflorescence axillary; corolla lobes valvate in bud:

6a Stigma divided into 4 or 5 lobes or arms; ovary 4- or 5-locular; ovules/seeds many ..... **Sabicea**

6b Pollen presenter cylindric, 2-lobed at the tip; ovary 2-locular; ovules/seeds 1 per locule:

7a Leaves, branches and recurved spines often in whorls of 3 ..... **Vangueriella**

7b Leaves and branches opposite; spines absent:

8a Leaves coriaceous, glabrous, drying bright green; stipules with a strongly keeled lobe; inflorescences not pedunculate; calyx limb reduced to a rim, shorter than the disc; anthers reflexed; fruit didymous; seeds with endosperm not streaked by granules ..... **Psydrax** subgen. **Phallaria**

8b Leaves chartaceous to coriaceous, not drying bright green; stipules lacking a keeled lobe; inflorescence pedunculate; calyx limb at least equalling the disc, often dentate, occasionally lobed; anthers exserted but not reflexed; fruit ± obcordate in outline; seed with endosperm streaked with granules ..... **Keetia**

5b Inflorescence terminal, often one-sided pseudoaxillary or sometimes with additional axillary inflorescences near apex of main stem:

9a Corolla lobes valvate in bud, flowers heterostylous; stipules 2- or more-lobed:

10a Ovules/seeds 1 per locule; raphides present ..... **Psychotria**

10b Ovules/seeds many per locule; raphides absent or present:

11a Flowers mostly in pairs on lax panicles; fruit ± 5 mm in diameter, tardily dehiscent into 2 cocci; raphides present ... **Sacosperma**

11b Flowers in ± dense, often showy panicles, mostly with one or more of the peripheral flowers developing one very large, showy, brightly coloured sepal with palmate venation; corolla lobes reduplicate-valvate in bud, tube mostly hairy outside, longer than 15 mm; fruit large (15–25 mm in diameter); ..... **Mussaenda**

9b Corolla lobes contorted in bud; fruit more than 10 mm in diameter, indehiscent; raphides absent:

12a Ovary 1-locular with 2(?4) parietal placentas; pollen presenter large:

13a Flowers solitary, terminal, pubescent outside; pollen simple ..... **Pseudogardenia**

13b Flowers several in terminal clusters, glabrescent to pubescent outside; pollen in tetrads ..... **Macrosphyra**

12b Ovary 2(3 or 4)-locular with placenta attached to the septum or axile, or ovule basal if solitary:

14a Ovules/seeds 1 to several per locule; seeds either globose (if solitary) or frequently with an adaxial excavation; anthers with short filaments:

15a Ovules 1–several, impressed on a placenta attached to the septum; corolla with 5 reflexed lobes; seeds several per fruit, with a small cavity and entire endosperm; stipules often triangular-ovate, dark (dark green when fresh, turning black when dry) ..... **Tarenna**

15b Ovule single, erect from the base of each locule; corolla with 4 or 5 spreading lobes; seed 1 per fruit, spherical with strongly ruminate endosperm; stipules fimbriate or shortly sheathing and aristate, not dark green to black ..... **Rutidea**

14b Ovules/seeds many; anthers almost sessile:

16a Vegetative parts completely glabrous; corolla tube glabrous outside; fruit barrel-shaped with a long peduncle, smooth when ripe ..... **Atractogyne**

16b Vegetative parts with silky or tomentose indumentum; corolla tube silky outside; fruit narrowly to broadly ellipsoid, ribbed and often wrinkled between ribs ..... **Aoranthe**

Key 4—Shrubs or trees

1a Leaf blades 100–340 mm long, with white, felted tomentum beneath; stipules 30–40 mm long, reddish; inflorescences axillary, each enclosed in an involucre ..... **Stipularia africana** Beauv.

1b Leaf blades, stipules and inflorescences not as above:

2a Flowers sessile, in a dense, sessile, many-flowered cluster subtended by broad bracts and borne at ends of lateral shoots opposite a single leaf; leaves up to 1.4 m long and 0.5 m broad; habit resembling that of *Carica papaya* ..... **Schumanniophyton**

2b Combination of characters not as above:

3a Flowers in globose or capitate heads:

4a Calyces ± joined together; fruits a fleshy syncarp:

5a Inflorescences 4–9 mm in diameter (excluding corollas), 5–20-flowered; flowers heterostylous; corolla lobes valvate, later spreading; ovules/seeds 1 per locule; raphides present ..... **Morinda**

5b Inflorescences 30–50 mm in diameter (excluding corollas) distinctly more than 35-flowered; flowers not heterostylous; corolla lobes

imbricate, remaining erect; ovules/seeds many; raphides absent:

6a Stipules small, triangular, apex obtuse or sharply notched, ± persistent; placenta attached to middle of septum, somewhat discoidal with ovules spreading in all directions ..... **Sarcocephalus**

6b Stipules large, elliptic or obovate, deciduous or ± persistent; placenta attached to upper third of septum, Y-shaped, ovules spreading in all directions but predominantly pendulous ..... **Nauclea**

4b Calyces not joined together; fruits not forming a syncarp:

7a Inflorescence heads perfectly and densely spherical; bracts caducous or insignificant; interfloral bracteoles absent or present:

8a Ovules solitary and pendulous in each locule; fruit fleshy ..... **Cephalanthus natalensis** Oliv.

8b Ovules many; fruit dry:

9a Corolla lobes valvate, ending in an appendage; seeds small, with winged margins:

10a Stipules conspicuous, oval, flat, often reddish; capsule ribbed; stigma mitriform ..... **Hallea**

10b Stipules not conspicuous, triangular, caducous; capsule not ribbed; stigma spherical to bilobed in bud ..... **Corynanthe**

9b Corolla lobes imbricate; stipules not so markedly conspicuous, never red; flowering heads solitary; seeds not winged:

11a Leaves paired, broadly elliptic; inflorescence terminal, at least 20–40 mm across (including corollas); calyx lobes spathulate, persistent; wood bright orange; stipules 30–56 x 15–35 mm, oblanceolate to broadly oblanceolate ..... **Burttdavya nyasica** Hoyle

11b Leaves in whorls of 3 or 4, lanceolate; inflorescence lateral, up to 25 mm across (including corollas); calyx lobes oblong, eventually deciduous; wood not bright orange; stipules smaller, ± triangular, bifid ..... **Breonadia salicina** (Vahl) Hepper & Wood

7b Inflorescence heads not perfectly spherical, often subtended by bracts:

12a Ovules/seeds many per locule; ovary 2-, 4- or 5-locular:

13a Corolla lobes terminating in a conspicuous appendage; stigma spherical, undivided; ovary 2-locular ..... **Corynanthe**

13b Corolla lobes small, without terminal appendage; style ending in 4 or 5 narrow branches; ovary 4- or 5-locular ..... **Sabicea**

12b Ovules/seeds 1 per locule:

14a Corolla lobes valvate; flowers heterostylous; inflorescence with bracts surrounding base of inflorescence; bacterial nodules absent from leaves; raphides present ..... **Psychotria**

14b Corolla lobes contorted; flowers with style and anthers always exserted; inflorescence with bracts small or sometimes larger and ± membranous; bacterial nodules present in leaves; raphides absent ..... **Pavetta** (partly)

3b Flowers solitary or in lax to compact or spike-like inflorescences:

15a Inflorescences spike-like, racemose or narrowly thyrsoid:

16a Inflorescences subtended by large red leaf-like, paired, stipitate, venose bracts; corolla cylindric below, funnel-shaped or narrowly campanulate above with erect lobes, glabrous outside; fruit a capsule; seeds conspicuously winged ..... **Hymenodictyon floribundum** (Hochst. ex Steud.) B.L.Robinson

16b Inflorescences not subtended by conspicuous bracts; corolla ± salver-shaped, pubescent outside; fruit a berry; seeds not winged ..... **Bertiera angusiana** N.Hallé

15b Inflorescences not as above:

17a Calyx limb often white, eccentric, entire or ± shallowly lobed, venose and accrescent, up to 28 mm wide in fruit; fruit dry and often tardily dehiscent; corolla tube narrowly tubular, 3–5 mm long ..... **Carphalea**

17b Calyx limb not as above, usually with 4 or 5 distinct lobes or teeth, or reduced to a rim:

18a At least a few calyx lobes large and leaf-like in each inflorescence, mostly longer and wider than 20 mm, white, cream or red:

19a Fruit ± succulent or at least indehiscent; corolla lobes reduplicate-valvate, apiculate ..... **Mussaenda** (partly)

19b Fruit dry, dehiscing at the apex; corolla lobes induplicate-valvate, bearing subapical filiform appendages up to 2 mm long ..... **Pseudomussaenda**

18b Calyx lobes equal or slightly unequal and green, or if 1 or 2 enlarged into a coloured lamina then not as long or wide as 20 mm:

20a Small tree or shrub growing in the littoral zone just above high tide level, the stems covered with large leaf scars; leaves large, crowded at the ends of the branchlets; calyx limb truncate; corolla white, salver-shaped, velvety outside, the tube ± 25 mm long with 4–9 lobes; ovary 4–9-locular; fruit globose, fibrously woody, up to 35 mm in diameter, containing one multi-seeded stone ..... **Guettarda speciosa** L.

20b Not growing in the littoral zone, or if so then calyx limb, corolla, fruit and habit not as above:

21a Corollas valvate, mostly white and not markedly showy; flowers heterostylous; raphides present:

22a Inflorescences axillary or supra-axillary:

23a Inflorescences corymbose to subumbellate, at least some flowers pedicellate; ovules many in each locule; fruit orange or red when ripe ..... **Pauridiantha**

23b Inflorescences congested, pedicels usually absent; ovule solitary in each locule; fruit not orange or red:

24a Leaves with many arching lateral nerves and closely parallel scalariform tertiary venation; locules 4–12; ovules erect; fruit blue when ripe, with 4–12 pyrenes; inflorescences axillary, sessile or pedunculate ..... **Lasianthus**

24b Leaves with venation mostly closely reticulate; locules 2; ovules pendulous; fruit probably green to black when ripe, 1-seeded; inflorescences supra-axillary or less often axillary, always pedunculate ..... **Craterispermum**

22b Inflorescences terminal:

25a Stipules entirely sheathing, ± 10 mm long, several-fimbriate; ovary superior; fruit apex devoid of calyx limb remains ..... **Gaertnera**

25b Stipules sheathing only at the base, not fimbriate; ovary inferior; fruit crowned by calyx limb or with apical scar:

26a Styles divided into 6–8 filiform lobes; ovary with 4–10 locules, each containing 2(3) collateral erect ovules, but only 1 develops into a seed in each locule; corolla-tube ± 10 mm long, woolly tomentose outside or at least with pubescent lines; drupes red, with woody putamen; plants mainly littoral or in coastal bushland ..... **Triainolepis**

26b Styles 2-fid; ovary/fruit 2-locular; other characters not as combined above:

27a Pyrenes without a well marked dehiscence; testa red-brown or purplish; endosperm often ruminate; bacterial nodules sometimes present in the leaves; stipules entire or bifid ..... **Psychotria**

27b Pyrenes with ± well marked dehiscence; testa pale; endosperm not ruminate; bacterial nodules never present in the leaves; stipules never lobed, frequently becoming corky:

28a Inflorescence axes not white; pyrenes opening by 2 marginal slits; flower-buds never winged; shrubs with leaves mostly developing after the flowers have matured; stems corky ..... **Chazaliella**

28b Inflorescence axes often white tinged purple; pyrenes opening by 1 dorsal slit; flower buds and corolla lobes often with longitudinal narrow wing-like keels (but not present in some species); flowers contemporary with mature leaves; stems not markedly corky ..... **Chassalia**

21b Corollas valvate, contorted or sometimes imbricate; flowers mostly with secondary pollen presentation, occasionally heterostylous or homostylous (if both valvate and heterostylous then corolla usually coloured or pubescent); raphides absent:

29a Corolla lobes valvate; style topped with a globose, cylindrical or mitriform pollen presenter, often ridged; pollen presenter 2- to several-lobed at apex when mature, hollow with style attached internally or occasionally with style attached at the base; flowers never heterostylous; locules 2–10; pyrene walls woody or sometimes crustaceous; inflorescences always axillary ..... VANGUERIEAE (see Key 5)

29b Corolla lobes contorted or imbricate, or if valvate then pollen presenter not as above or flowers heterostylous; locules 2, rarely several to many; if the fruit is a pyrene then walls scarious to crustaceous; inflorescences terminal, lateral or axillary:

30a Spines present; corolla showy; fruit large:

31a Lateral spurs (brachyblasts) always absent; flowers supra-axillary, 2 per node; corolla trumpet-shaped, longitudinally ribbed; seeds 8–16 per fruit, ± 10 mm in diameter ..... **Didymosalpinx norae** (Swynnerton) Keay

31b Lateral spurs absent or present; flowers not supra-axillary; corolla not trumpet-shaped; seeds many, up to 5 mm in diameter:

32a Corolla tube much shorter than the lobes; calyx lobes oblong, ovate or spathulate, persistent and ± accrescent in fruit; leaves very often pubescent ..... **Catunaregam**

32b Corolla tube distinctly longer than the lobes; calyx limb with short triangular teeth, persistent in fruit; leaves always glabrous ..... **Hyperacanthus**

30b Spines absent; corolla and fruit as above or not:

33a Plants deciduous; flowers and fruit clustered on mature stems with the leaves restricted to apical and lateral shoots; bracts/bracteoles chaffy; calyx with limb tube completely absent and lobes lanceolate; corolla funnel-shaped; fruit 12–20 mm in diameter with large scar; (if a deciduous plant with chaffy bracts then calyx limb shortly tubular and persistent in fruit, see couplet 58a) ..... **Feretia aeruginescens** Stapf

33b Plants evergreen, or if deciduous then other characters not combined as above:

34a Inflorescences axillary, in both axils of a node (sometimes at naked nodes) or sometimes supra-axillary, pedunculate or sessile, if on brachyblasts (contracted lateral spurs) see contrast 46a; corolla lobes always contorted:

35a Flowers solitary, supra-axillary; corolla trumpet-shaped, longitudinally ribbed; fruit 20–33 mm long, thin-walled; seeds with fibrous coat ..... **Didymosalpinx norae** (Swynnerton) Keay

35b Flowers 1–many, axillary; corolla, fruit and seeds not as above:

36a Inflorescences pedunculate, distinctly and rather laxly branched; flowers always pedicellate:

37a Stipules often blackening when dry; corolla tube cylindric, ± as long as lobes; seeds with a small ± circular excavation, or a partly ruminate endosperm ..... **Tarenna** (partly)

37b Stipules not tending to blacken when dry; corolla tube and seeds not as above:

38a Corolla subrotate; tube ± 1 mm long; endosperm ruminate, visible as longitudinal striations on seed surface ..... **Galiniera saxifraga** (Hochst.) Bridson

38b Corolla funnel-shaped to campanulate; endosperm entire:

39a Corolla lobes usually longer than tube; calyx lobes divided nearly to base into narrowly triangular lobes; pollen presenter with 10 narrow membranous ciliate wings ..... **Kraussia**

39b Corolla lobes shorter than tube; calyx shallowly lobed; pollen presenter not winged ..... **Pouchetia**

36b Inflorescences 1–few-flowered, or congested glomerules, sometimes shortly pedunculate; flowers often pedicellate:

40a Stipules 10–12 mm long, attenuate from a triangular base, eventually caducous; flowers not pedicellate, mostly borne at naked nodes; both anthers and style included well below the corolla throat; seeds 2–4 per fruit ..... **Belonophora hypoglauca** (Welw. ex Hiern) A.Chev.

40b Stipules smaller, awned or more broadly triangular; inflorescences mostly borne at leafing nodes;

flowers often pedicellate; anthers and style both exserted, or less often either or both included at or near the throat; seeds 1, or few to several:

41a Calyx limb reduced to a rim, usually shorter than the disc, but occasionally truncate and ± equalling the disc; corolla tube ± equal to lobes; anthers and style exserted; fruit 2-seeded; seeds with a well-defined groove on ventral face (typical coffee-beans); inflorescence 1–several-flowered ..... **Coffea**

41b Calyx limb mostly at least as long as the disc, truncate, dentate or lobed; fruit 2–many-seeded; seeds lacking a ventral groove:

42a Stipules triangular-acuminate, sometimes shortly aristate, often caducous, sometimes obscured by inflorescences even at apical node; small, round, often cordate leaves often present at base of lateral branches; style undivided, shortly bifid at apex or sometimes distinctly bifid, usually hairy; flowers several in sessile or pedunculate glomerules, very rarely pedicellate:

43a Flowers 5(6)-merous; anthers exserted; bracts and bracteoles triangular-acuminate, not forming cupules; seeds with endosperm entire and testa wrinkled-striate .... **Cremaspora triflora** (Thonn.) K.Schum.

43b Flowers 4-merous; anthers included, or only tips showing; bracts and bracteoles cupular, often thinly chaffy; seeds with ruminate endosperm and testa with fingerprint-like striations ..... **Polysphaeria**

42b Stipules shortly sheathing at base, distinctly aristate; modified leaves not present at base of lateral branches; style clearly 2-armed, usually glabrous; flowers mostly fewer, stalked or subsessile:

44a Leaves with acumen very distinctive, 8–40 mm long; calyx limb tube truncate, 25–70 mm long, characteristically split down one side; anthers locellate; ovule/seeds one per locule; testa apparently absent ... **Calycosiphonia spathicalyx** (K.Schum.) Robbr.

44b Leaves with acumen much shorter; calyx limb seldom as above; anthers not locellate; ovules/seeds mostly more than one per locule; testa present:

45a Anthers ± medifixed, the connective not enlarged; thecae ± contiguous and subparallel; bacterial nodules absent ..... **Tricalysia**

45b Anthers basifixed, the connective enlarged so that the thecae diverge; linear bacterial nodules often present along the midrib and petiole ..... **Sericanthe**

34b Inflorescences terminal on main and lateral branches (occasionally appearing axillary by extreme reduction of lateral branches, in which case bacterial nodules are present in the leaves) or lateral (i. e. alternate, with inflorescence in only one axil at each node); sometimes with a few axillary inflorescences in addition to the terminal one, or borne on brachyblasts (contracted lateral spurs); corolla lobes contorted, valvate or sometimes imbricate:

46a Subshrubs; corolla lobes valvate, very narrowly lanceolate, subequal to tube in length, suberect; both capitate stigma and stamens exserted; calyx lobes not persistent in fruit; capsule often with 1 persistent and 1 falling lobe; seeds numerous, unwinged ..... **Virectaria major** (K.Schum.) Verdc.

46b Mostly shrubs or trees; corolla lobes and fruit not as above:

47a Corolla tubular below, funnel-shaped to campanulate above; corolla lobes erect, often cowl-shaped and ending in an appendage; capsule narrowly ellipsoid or subcylindric; seeds with wing bifid at one end:

48a Petiole with articulate base; abaxial side of leaf blade hairy; corolla appendages absent; anthers included; style exserted ..... **Hymenodictyon**

48b Petiole not articulate at base; abaxial side of leaf blade glabrous; corolla appendages present; anthers and style either both included or both exserted:

49a Corolla tube gradually widening; corolla lobes with a spherical, curved or linear and terminally thickened appendage; anthers and style exserted; stigma spherical and undivided; capsule loculicidal and above somewhat septicidal ..... **Corynanthe**

49b Corolla tube differentiated in an apical bladder and a basal narrow cylindrical part; corolla lobe appendages linear, terminally not thickened; anthers and style included; stigma bilobed; capsule septicidal and mostly partly loculicidal ..... **Pausinystalia**

47b Corollas not as above; fruit, if capsular, then ± globose and not lenticellate; seeds unwinged, or with a fimbriate wing:

50a Corollas with a coloured star-shaped eye at the throat; corolla lobes valvate or imbricate; flowers heterostylous or isostylous; ovules many in each locule; fruit berry-like, slightly fleshy to fleshy:

51a Each stipule almost completely divided into 2 separate lobes, rather small and caducous; corolla lobes imbricate (quincuncial); calyx lobes ± leaf-like, often somewhat spathulate, persistent in fruit; fruit globose, slightly fleshy but soon dry ..... **Heinsia**

51b Each stipule entire or if divided not completely 2-lobed; corolla lobes reduplicate-valvate;

calyx lobes triangular, at the most slightly spathulate; fruit fleshy, indehiscent, often lenticellate ..... **Mussaenda** (partly)

50b Corollas lacking an eye as above; corolla lobes contorted; flowers mostly with secondary pollen presentation; ovules 1–many in each locule; fruit berry-like (often large and ± woody), drupe-like or sometimes capsular:

52a Inflorescences consisting of several- to many-flowered cymes, one borne at every other node; flowering nodes often with only 1 developed leaf; leaf pairs on non-flowering nodes either of 2 similar or very dissimilar leaves:

53a Leaf pairs on flower-bearing and non-flowering nodes similar; ovary 4-locular..... **Morelia**

53b Flower-bearing node with only 1 developed leaf; ovary 1- or 2-locular:

54a Flowers with densely hairy throat; anthers exserted from corolla tube; fruit less than 10 mm in diameter ..... **Aidia**

54b Flowers with glabrous throat, sometimes with a band of hairs below the anthers; anthers ± included in corolla tube; fruit longer than 50 mm:

55a Leaf pairs on non-flowering nodes of 2 very dissimilar leaves; flower buds and corolla lobes tapering to a fine point; ovary 2-locular with axile placentas .... **Massularia**

55b Leaf pairs on non-flowering nodes of 2 similar leaves; flower buds and corolla lobes blunt-tipped; ovary 1-locular with 2 paricta1 placentas ..... **Brenania**

52b Inflorescences not as above and the flowering nodes not anisophyllous; flowers and fruit small to large:

56a Inflorescences strictly lateral; stipules green, moderately conspicuous, triangular or ovate, scarcely sheathing; seeds not held together by pulpy tissue, seed surface with a fingerprint-like pattern of striations:

57a Shrubs or small trees, seldom less than 1 m tall; corolla tube narrowly cylindric .... **Oxyanthus**

57b Small shrubs, or less often a tree, 0.3–1.8(–8) m tall; corolla tube cylindric at base and funnel-shaped above ..... **Mitriostigma axillare** Hochst.

56b Inflorescences and stipules not as above; seeds 1 or few to numerous, often held together by pulpy tissue; seed surface lacking a fingerprint-like pattern:

58a Plants with brachyblasts (contracted lateral spurs) or cushion shoots:

59a Flowers precocious, subtended by a series of chaffy bracts/bracteoles; corolla tube narrowly cylindric, 10–42 mm long; calyx limb ± 1.5 mm long, shortly tubular, repand to shortly dentate, persistent in fruit; fruit 5 mm in diameter, 2-seeded ..... **Argocoffeopsis eketensis** (Wernham) Robbr.

59b Flowers contemporary with the leaves; bracts/bracteoles not chaffy; calyx limb tube 1–2.5 mm long, distinctly lobed; fruit few- to many-seeded:

60a Corolla tube usually at least 15 mm long; calyx lobes narrowly triangular to lanceolate ..... **Gardenia brachythamnus** (K.Schum.) Launert

60b Corolla tube up to 7 mm long; calyx lobes ovate, often spathulate, separated by broad sinuses:

61a Corolla rotate, tube scarcely exceeding calyx limb tube; calyx lobes 4–7 (–13) mm long; fruit yellow-green or brown when ripe, 18–33 x 17–25 mm ..... **Catunaregam**

61b Corolla funnel-shaped, tube longer than the lobes; calyx lobes 0.5–1.5 (–2.5) mm long; fruit black, 5–7 mm in diameter .... **Coddia rudis** (E.Mey. ex Harv.) Verdc.

58b Plants without brachyblasts or cushion shoots, lateral branches often short but with leaves clearly spaced:

62a Inflorescence usually borne on a very short shoot above a single leaf; corolla tube variously shaped, hairy outside:

63a Flowers markedly showy; corolla tube 25–230 mm long, narrowly cylindric at base, campanulate or funnel-shaped above, terminal, solitary or sometimes 2 or 3 together; corolla lobes contorted to the left or right; fruit ± ovoid to globose, 18–85 mm long; ovules many; seeds many, compressed:

64a Flowers surrounded at base by persistent scarious scales; leaves deciduous, tufted at ends of shoots; calyx tube very short, lobes spreading .... **Euclinia**

64b Flowers not surrounded at base by scarious scales; leaves not markedly tufted at ends of shoots ..... **Rothmannia**

63b Flowers moderately showy; corolla up to 30 mm long; corolla lobes contorted to the left; fruit globose, ± 13 mm in diameter; ovules 2–10; seeds few, free; testa absent:

65a Corolla campanulate ..... **Heinsenia diervilleoides** K.Schum.
65b Corolla salver-shaped, often split along one side ..... **Aulacocalyx**
62b Inflorescence essentially terminal, sometimes overtopped by the growing apex, or pseudoaxillary (due to suppression of lateral branches); corolla tube mostly cylindric to narrowly funnel-shaped and glabrous or hairy outside:
66a Flowers 1 or up to 3, markedly showy, sometimes overtopped by the stem apex; fruit large; seeds many, in pulpy tissue:
67a Deciduous shrub; corolla yellow-green, purple-spotted; corolla tube much shorter than lobes; calyx limb with corky ridges protecting bud in dry season, not persistent in fruit but leaving a bull's-eye-like scar .... **Phellocalyx vollesenii** Bridson
67b Evergreen shrub; corolla white or cream, unmarked; corolla tube clearly longer than lobes; calyx limb not as above; fruit usually bearing persistent calyx limb:
68a Branches and leaves often ternate; stipules sheathing, often truncate but sometimes triangular, with sticky exudate when young; flowers solitary; calyx limb-tube truncate or often with decurrent lobes; corolla lobes contorted to the left; fruit thick-walled .. **Gardenia** (partly)
68b Branches and leaves not ternate; stipules ovate, tightly inrolled at apex and readily falling, lacking a sticky exudate; flowers 1–3; calyx lobes not decurrent; corolla lobes contorted to the right; fruit fairly thin-walled ..... **Hyperacanthus**
66b Flowers, if showy, then more numerous, never overtopped by stem apex; fruit mostly small to moderately large; seeds 1–few, or if many then seeds free:
69a Fruit a capsule, ± globose; seeds with a fimbriate wing; corolla distinctly pubescent outside; lobes 4–6; anthers ± two thirds exserted .... **Crossopteryx febrifuga** (Afzel. ex G.Don) Benth.
69b Fruit not dehiscent; seeds never winged; corolla pubescent or more often glabrous outside; lobes 4 or 5 (6); anthers usually fully exserted:
70a Calyx lobes subfoliaceous, 8–30 mm long, persistent in fruit; corolla large, tube 10–110 mm long, pubescent outside; fruit large, 8–22 mm in diameter; seeds many; stipules often conspicuous, either triangular and erect or ± rounded and reflexed:
71a Corolla tube much longer than lobes; anthers included, thecae undivided ..... **Leptactina**
71b Corolla tube shorter than or ± as long as tube; anthers sessile but more than half exserted, thecae divided into many small chambers arranged in 4 narrow longitudinal bands ..... **Dictyandra**
70b Calyx lobes not nearly as conspicuous as above; corolla generally smaller; seeds 1–many; stipules less conspicuous, never rounded and reflexed:
72a Flowers 4-merous; fruit 2-seeded; seeds ± hemispheric with an excavation on the ventral face:
73a Bacterial nodules usually present in the leaf blades, either scattered or arranged along the midrib; inflorescence sessile, laxly corymbose to subcapitate, never with rachis articulated, sometimes inflorescence pseudo-axillary due to reduction of lateral branches; bracteoles stipule-like; pollen presenter entire; seeds rugulose, moderately shiny ..... **Pavetta**
73b Bacterial nodules absent; inflorescence sessile or pedunculate; rachis sometimes white or tinted, often articulated; bracteoles linear, short; pollen presenter with 2 divaricate arms; seeds dull, often rusty-coloured, not rugulose ..... **Ixora**
72b Flowers 5(6)-merous; fruit 1–many-seeded; seeds variously shaped, entire or ruminate; stipules sometimes with the central area darkened:
74a Corolla lobes valvate; flowers heterostylous, borne in clusters on old wood ..... **Stelechantha**
74b Corolla lobes contorted; flowers not heterostylous, usually in cymes or in clusters but rarely on old wood:
75a Ovary 1-locular; ovules many on 2(4) parietal placentas:
76a Deciduous shrubs with conspicuous scarious or chaffy

persistent stipules; flowers conspicuous **Macrosphyra**
76b Evergreen shrubs to medium-sized trees; stipules triangular to duck bill-shaped, not scarious or chaffy, flowers usually small ..... **Coptosperma**
75b Ovary 2-locular; ovules 1–many; placentation axile or basal:
77a Flowers solitary or in pairs ..... **Psilanthus**
77b Flowers in few- to many-flowered inflorescences:
78a Corolla tube campanulate in upper part; stipules 12–30 mm long, slightly fused at base; fruit ellipsoid, ribbed and often wrinkled between ribs ..... **Aoranthe**
78b Corolla tube cylindric, often narrowly so; stipules shorter than 10 mm, free; fruit smooth, often ± globose:
79a Ovule 1 per locule, with basal placentation; apex of anther connective slender, tapering, exceeding the anther by 0.3–0.4 mm ..... **Nichallea**
79b Ovules more than 1 per locule, or if only 1 than placentation not basal; anther connective shortly apiculate or not exceeding the thecae ..... **Tarenna**

Key 5—Vanguerieae (from couplet 20a in Key 1 and couplet 29a in Key 4)

1a Spines present:
2a Branches and leaves usually in whorls of 3 ..... **Vangueriella**
2b Branches and leaves opposite:
3a Calyx lobes conspicuous, leaf-like, 5–9 mm long, ± 7 times as long as the calyx tube, persistent in fruit; spines supra-axillary on the branches, or present on trunks of saplings, often quite robust; pyrenes 3–5 ..... **Lagynias lasiantha** (Sond.) Bullock
3b Calyx lobes not so conspicuous; other characters not combined as above:
4a Spines present on trunks of young trees, or restricted to young or coppice shoots and ternately arranged, or less often paired from leaf axils; ovary 2- or 3-locular; corolla tube lacking ring of deflexed hairs inside; corolla lobes not apiculate; fruit 12–25 mm long ..... **Canthium** subgen. **Lycioserissa**
4b Spines positioned above lateral branches (sometimes reduced cushion shoots), or from leaf axils of more mature stems; other characters not combined as above:
5a Calyx lobes linear, 1.0–3.5 mm long, persistent in fruit; ovary always 2-locular ..... **Rytigynia bugoyensis** (K.Krause) Verdc.
5b Calyx lobes triangular, up to 1 mm long, acute; ovary 2- or 3–5-locular:
6a Inflorescences many-flowered, corymbose; peduncles 8–35 mm long ..... **Plectroniella armata** (K.Schum.) Robyns
6b Inflorescences few-flowered, or flowers solitary; peduncles seldom reaching 8 mm in length:
7a Stipules with a few hairs inside; pedicels 8–15 mm long; corolla tube 2.5–4 mm long ..... **Canthium kuntzeanum** Bridson
7b Stipules with tuft of hairs inside; pedicels shorter; corolla tube not longer than 2 mm:
8a Spines only occasionally arising above reduced cushion shoots; calyx limb 0.25–0.6 mm long, truncate or shortly toothed; locules 2 or 3(5); fruit subglobose ..... **Rytigynia** (partly)
8b Spines always arising above reduced cushion shoots; calyx limb 0.5–1 mm long, divided almost to base into triangular or narrowly triangular lobes; locules always 2; fruit somewhat dorsiventrally flattened ..... **Canthium** subgen. **Canthium**
1b Spines absent (rarely some side branches spine-like in *Vangueria randii* and *Cuviera semseii*):
9a Branches and/or leaves usually in whorls of 3–5:
10a Ovary 2-locular; pollen presenter 2-lobed at apex ..... **Vangueriella**
10b Ovary 3–5-locular; pollen presenter 3–5-lobed or ridged ..... **Fadogia**
9b Branches and leaves opposite:
11a Inflorescences entirely enclosed in bud by paired connate persistent bracts, umbellate or sometimes 1-flowered; pollen presenter solid with style attached to the base; leaves usually with tertiary venation obscure; corolla throat densely congested with hairs ..... **Pyrostria**
11b Inflorescences never enclosed by paired bracts; pollen presenter hollowed at the base with the style attached internally; other characters not combined as above:
12a Corolla lobes 20–40 mm long, linear-lanceolate, greatly exceeding the tube, erect, tomentose or pubescent outside; fruit 20–40 mm long with calyx remains triangular to linear; pyrenes 2 ..... **Vangueriopsis lanciflora** (Hiern) Robyns
12b Corolla lobes not as above; fruit smaller, or if large then with more than 2 pyrenes, or with calyx remains cupular:
13a Climbing and/or scandent plants:
14a Leaves coriaceous, drying bright green, glabrous; stipules with a strongly keeled lobe; inflorescences not pedunculate; calyx limb reduced to a rim, shorter than the disc; anthers reflexed; fruit didymous; seeds with endosperm not streaked with granules ..... **Psydrax** subgen. **Phallaria**
14b Leaves chartaceous to coriaceous, not drying bright green, glabrous or pubescent; stipules lacking keeled lobe; inflorescences pedunculate; calyx limb at least equalling the disc, often dentate, occasionally lobed; anthers exserted but not reflexed; fruit ± obcordate in outline; seeds with endosperm streaked with granules ..... **Keetia**
13b Trees, shrubs (sometimes subscandent), or subshrubby herbs:

15a Ovary/fruit 2-locular (rarely with occasional 3-locular ones as well); pollen presenter 2-lobed at tip:
16a Subshrubby herbs or single-stemmed shrubs from a woody rootstock, up to 2 m tall:
17a Leaves coriaceous; corolla coriaceous, drying wrinkled; pyrenes very thickly woody; inflorescences frequently supra-nodal ... . **Multidentia concrescens** (Bullock) Bridson & Verdc.
17b Leaves not coriaceous; corolla not coriaceous; pyrenes not thickly woody; inflorescences axillary:
18a Plants small, 150–300 mm tall; leaves glabrous or with sparse bristly hairs on both surfaces; calyx lobes somewhat leaf-like, narrowly oblong, elliptic or lanceolate; fruit 15–20 mm across ... **Pygmaeothamnus zeyheri** (Sond.) Robyns
18b Plants larger, at least 0.5 m tall; leaves velvety beneath, discolorous; calyx lobes linear; fruit up to 10 mm across .... **Rytigynia decussata** (K.Schum.) Robyns
16b Shrubs or trees (1–)2–20 m tall:
19a Styles usually at least twice as long as the corolla tube; pollen presenter ± cylindric; stipules glabrous within; disc sometimes pubescent; inflorescences usually subtended by leaves; seed with cotyledons perpendicular to ventral face:
20a Trees or shrubs, sometimes scandent; leaves typically subcoriaceous to coriaceous, drying light green, or occasionally chartaceous in deciduous species; if plants scandent, then stipules triangular to truncate at the base with a strongly keeled lobe; calyx limb consisting of a dentate to repand rim, usually much shorter than the disc, only occasionally equalling the disc; anthers usually reflexed; fruit not or scarcely indented at the apex except when ± didymous; pyrene cartilaginous to woody with shallow apical crest ..... **Psydrax**
20b Scandent bushes with lateral branches set at right angles to the main ones, often subtended by modified leaves; leaves chartaceous to subcoriaceous, rarely coriaceous; stipules lanceolate to ovate or triangular, acuminate; calyx limb repand to dentate, equalling or sometimes exceeding the dise; anthers usually erect; fruit strongly or slightly indented at the apex, typically obcordate in outline; pyrene woody with lid-like area surrounding the crest (either positioned on ventral face or across the apex) ..... **Keetia**
19b Styles usually only slightly longer than the corolla tube (save in *Multidentia exserta* which has stipules hairy within); pollen presenter mostly as broad as long; stipules hairy or glabrous within; disc glabrous; inflorescences often subtended by leaves; seeds with cotyledons parallel to ventral face:
21a Calyx lobes linear-oblong or oblong-spathulate, 2.3–4 mm long, persistent on fruit; inflorescence clearly branched, bearing linear or subfoliaceous bracts and bracteoles; corolla lobes acuminate or shortly appendaged .... **Cuviera** (partly)
21b Calyx lobes, if present, not as above; inflorescence branched or unbranched, but bracts and bracteoles usually inconspicuous; corolla lobes blunt, or if acuminate or appendaged then inflorescence ± unbranched:
22a Calyx limb tube cupular, repand or lobed but lobes rarely exceeding it; fruit large; pyrenes very thickly woody, strongly irregularly ridged with lines of dehiscence apparent; leaves discolorous, mostly with a conspicuous network of tertiary nerves; corolla tube with a ring of deflexed hairs inside, lobes never apiculate; pollen presenter spherical to elongate-ellipsoid, ribbed ..... **Multidentia**
22b Calyx limb tube obsolete or short, lobes absent or, if present, usually greatly exceeding the tube; pyrenes not so thickly woody, nor ridged as above; other characters not combined as above:
23a Flowers mostly in many-flowered, pedunculate dichasial or complicatedly branched cymes, occasionally subumbellate by reduction; leaves often restricted to new growth but not strictly so:
24a Stipules seldom sheathing at the base when mature, often becoming corky outside, if lobed then lobe not decurrent and often caducous; leaves strictly restricted to new growth; inflorescence with flowers usually arranged to one side of the ultimate inflorescence branch; calyx limb ± obsolete; fruit obcordate in outline and strongly indented at the apex or obovoid ..... **Canthium** subgen. **Afrocanthium** (partly)
24b Stipules sheathing at the base, bearing a linear to subulate, often decurrent lobe; leaves occasionally restricted to new growth; inflorescence not as above; calyx limb lobed to the base or almost so, lobes often somewhat unequal; fruit slightly indented at the apex ..... **Canthium** subgen. **Lycioserissa**
23b Flowers solitary, or in few- to several-flowered fascicles, subumbellate or less often with rudimentary branches, peduncles mostly, but not always, suppressed; leaves well spaced along branches or restricted to cushion shoots:
25a Leaves restricted to very short reduced branchlets or cushion shoots, hence pseudo-verticillate in appearance; inflorescences always at leafless nodes ..... **Canthium** subgen. **Afrocanthium** (partly)
25b Leaves not restricted to short branchlets; inflorescences in axils of normal leaves:
26a Flowers functionally unisexual, the female inflorescence 1-flowered, the male few- to many-flowered; stipules not pubescent inside; corolla tube very short, 1–2 mm long; lobes erect .... **Canthium** subgen. **Bullockia**
26b Flowers not functionally unisexual; stipules pubescent to villous inside; corolla tube usually, but not always, longer than 2 mm; corolla lobes mostly spreading:
27a Corolla tube glabrous or with few hairs within; calyx limb lobed to the base; young stems scarcely lenticellate; fruit 13–25 mm across; corolla lobes neither acuminate nor appendaged .... **Canthium** subgen. **Lycioserissa**
27b Corolla tube with a ring of deflexed hairs within, or occasionally glabrous; calyx limb shortly tubular, sometimes dentate; young stems often conspicuously lenticellate; fruit up to 14 mm across; corolla lobes blunt, acuminate or appendaged:
28a Leaf blades drying blackish, up to 40 mm long, acute to obtuse at apex; stipules with few hairs inside; corolla lobes acute ..... **Canthium kuntzeanum** Bridson

28b Leaf blades not drying blackish, up to 65 mm long, narrowly acuminate or attenuate at apex; stipules pubescent within; corolla lobes appendaged ..... **Rytigynia** (partly)

15b Ovary/fruit 3–8-locular (rarely with occasional 2-locular ones as well); pollen presenter 3–8-lobed at tip:

29a Calyx lobes conspicuous, subfoliaceous, up to 6 mm wide; cymes branched with scattered, ± leaf-like bracts and bracteoles; leaves drying blackish, restricted to non-woody apical stems; pyrenes with pronounced keels ..... **Cuviera semseii** Verdc.

29b Calyx lobes ± absent or various, but if as broad as above then other characters not combined as above:

30a Calyx lobes oblanceolate, spathulate, oblong-elliptic to oblong or occasionally narrowly oblong, (1)1.5–5.5 mm wide, always densely velvety:

31a Corolla bright orange or orange-yellow, rusty tomentose outside; tube 17.5–25 mm long, greatly exceeding calyx lobes; fruit ± 14 mm across with rusty coloured velvety pubescence; leaf blades drying dark with a fine network of pale yellowish nerves above and pale velvety beneath ..... **Ancylanthos**

31b Corolla cream or yellow-green, indumentum not rusty outside; tube much shorter, often exceeded by calyx lobes, or if as long, then curved; fruit 15–45 mm across, ± glabrous; leaf blades lacking a reticulum of nerves:

32a Inflorescence compact, few- to several-flowered; pedicels ± obsolete to 7 mm long; leaf blades scarcely discolorous ..... **Pachystigma macrocalyx**

32b Flowers solitary or inflorescence lax, few- or several-flowered; pedicels always clearly present; leaf blades distinctly discolorous ..... **Lagynias**

30b Calyx lobes ± absent, or if present, short, narrowly triangular or linear, occasionally narrowly oblong, often velvety:

33a Calyx lobes short, 0.5–1.0 mm long; calyx tube and corolla both entirely covered by dense pale, curled hairs; fruit ± 10 mm across, drying black, ± glabrous or with scattered cottony hairs; indumentum on young stems and lower surface of leaves especially densely felted; shrubs 0.3–4.0 m tall with branched stems ..... **Fadogiella**

33b Calyx lobes seldom as short; if indumentum present on calyx and flower buds then differing in density and/or type, and mostly with straight hairs; fruit large or small, lacking cottony hairs; small trees, shrubs, or pyrophytes:

34a Suffrutescent plants with herbaceous or subshrubby, mostly (but not always) unbranched stems from a woody rootstock, up to 1.2 m tall (pyrophytes):

35a Leaves mostly (but not always) in whorls of 3–5; calyx limb truncate, dentate or lobed; corolla large or small; lobes blunt, apiculate or infrequently subulate (*F. chlorantha*) ..... **Fadogia**

35b Leaves in pairs or rarely in whorls of 3; calyx limb with linear or linear-oblong lobes; corolla never large; lobes apiculate ..... **Pachystigma** (partly)

34b Subshrubs, shrubs or small trees, if under 1.2 m tall, then stems branched:

36a Flowers solitary or 2–10(–15) umbellate; peduncle usually clearly present; fruit never large; calyx lobes reduced or dentate; corolla lobes blunt, apiculate or distinctly tailed ..... **Rytigynia** (partly)

36b Flowers 5–many, in pedunculate, branched inflorescences or sessile, contracted inflorescences; fruit large, 8–50 mm across, often with velvety hairs; calyx lobes linear, narrowly oblong or shortly so, in which case they can be somewhat triangular; corolla lobes clearly apiculate:

37a Plants glabrous, pubescent or densely pubescent; inflorescence a dichasial cyme with flowers scattered along the arms, usually lax and many-flowered but a few species with few-flowered or compact inflorescences; corolla glabrous or hairy outside ..... **Vangueria**

37b Plants densely pubescent, often velvety or woolly; inflorescences never branched; corolla densely hairy outside ..... **Tapiphyllum** (partly)

Agathisanthemum Klotzsch

(Rubioideae—Hedyotideae)

Verdcourt: 254 (1976); Gonçalves: 186 (1982); Verdcourt: 107 (1989).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aidia Lour.

(Cinchonoideae—Gardenieae)

Loureiro: 143 (1790); Petit: 173 (1962); Hallé: 164 (1970); Tirvengadum & Sastre: 257 (1986); Bridson & Verdcourt: 487 (1988); Bridson: 226 (1998); White *et al.*: 461 (2001); Coates Palgrave: 1051 (2002).

Randia L. in part; Hiern: 457 (1898); Good: 12 (1926b).

Small trees or shrubs. **Leaves** opposite, petiolate, in equal pairs or at flower-bearing nodes unequal, or even one reduced to a deciduous scale; domatia sometimes present; stipules basally ± triangular, erect, acute to subulate, often deciduous. **Flowers** bisexual, pedicellate, 5-merous, in unilateral, apparently axillary inflorescences at every other node; inflorescences lax or condensed cymes up to 70 mm long, few- to many-flowered, subsessile or pedunculate; bracts small, often deciduous. **Calyx**: tube ovoid or turbinate; tubular part of limb well-developed; lobes reduced or at least not over 3 mm long. **Corolla** white, yellow or green, the central part sometimes red; tube cylindric, with throat hairy; lobes contorted, overlapping to the left, acute. **Stamens** exserted; filaments arising in upper part of throat; anthers sagittate; pollen grains simple. **Ovary** 2(3)-locular, each locule containing a peltate hemispherical many-ovuled placenta; style exserted, developed into an oblong striate club of 2 adhering lobes. **Fruit** globose, small, marked with a circular scar left by the deciduous calyx-limb. **Seeds** many.

Species 18, tropical Asia and Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Amphiasma Bremek.

(Rubioideae—Hedyotideae)

Verdcourt: 261 (1976); Verdcourt: 111 (1989).

Sthn trop. Afr. 3, Angola, Zambia, Malawi, and sthn Afr.

Ancylanthos Desf.

(Ixoroideae—Vanguerieae)

Verdcourt: 800 (1991); Bridson: 343, 350 (1996); Bridson: 236 (1998); Bridson: 383 (1999).

Monotypic genus: *Ancylanthos rubiginosus* Desf.; sthn trop. Afr.: Angola, Zambia, Zimbabwe, and sthn Afr.

Anthospermum L.

(Rubioideae—Anthospermeae)

Verdcourt: 324 (1976); Puff: 174 (1986); Puff: 150 (1989); White *et al.*: 461 (2001); Coates Palgrave: 1130 (2002); Izidine & Bandeira: 52 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aoranthe Somers

(?Cinchonoideae—Mussaendeae)

Somers: 64 (1988); Bridson & Verdcourt: 489 (1988).

Randia L. in part. *Porterandia* as used for African species, not of Ridley; Hallé: 118 (1970).

Trees or lianas, sometimes shrubby; younger parts with silky or tomentose indumentum; twigs terete, often hollow. **Leaves** decussate, shortly petiolate, oblong to obovate, often unequal at base, hirsute, especially on nerves; tuft-domatia in axis of secondary and tertiary nerves; mesophyll containing crystal stars visible as very small dots; stipules interpetiolar, shortly connate at base, deciduous, leaving a ring of hairs on scar. **Inflorescence** terminal, pseudoaxillary, many-flowered, shortly pedunculate, erect, rarely ramiflorous. **Flowers** bisexual. **Calyx** cupular to tubular, with 5 short to long teeth, silky inside and outside; colleters present on inside. **Corolla**: tube shortly cylindrical in lower part, campanulate in upper part, silky outside except area at base, glabrous inside except 5 hair tufts in basal part; lobes 5, contorted to right, ovate to circular. **Stamens** 5, included in upper part of tube; filaments very short; anthers infra-medifixed, connective containing tannin cells. **Ovary** 2-locular; placentation axile, placenta T-shaped in cross section; ovules many, arranged all around placenta; style somewhat shorter than tube, cylindric with 10 longitudinal grooves, thickened at top into a club-shaped stigma. **Disc** cylindric, 5-lobed, often sparsely hispid on upper surface. **Fruit** 2-locular, narrowly or broadly ellipsoid, ribbed and often wrinkled between ribs, crowned with persistent calyx; pericarp fleshy, containing stony strings; endocarp thin. **Seeds** many, irregularly angular; hilum small, comma-shaped; embryo straight.

Species 5, trop. Africa; sthn trop. Afr. 3, Angola.

Argocoffeopsis Lebrun

(Cinchonoideae—Gardenieae)

Lebrun: 55 (1941); Robbrecht: 361 (1981b); Bridson: 226 (1998).

Lianas climbing by means of horizontal or recurved lateral branches, sometimes shrubs; bark papery, brown or grey, peeling off characteristically. **Leaves** in some species deciduous and then flowers appearing before leaves; often dimorphic: leaves on lateral twigs cuneate and oblong and short-lived; leaves on main twigs cordate and shorter; stipules forming a short sheath around stem with 2 interpetiolar awns. **Flowers** terminal but mostly appearing lateral by position on axillary and opposite brachyblasts with reduced or scarious leaves. **Calyx** small, mostly hidden by leaves of brachyblasts surrounding base of flower as an epicalyx; tube short; lobes 5–8, minute. **Corolla** salver-shaped, lobes 5–8, contorted to left. **Stamens**: anthers arising in throat of corolla, either sessile and half included, or with a distinct filament and exserted. **Ovary** 2-locular; ovules 1 per locule. **Fruit** a berry-like drupe; endocarp membranous. **Seeds** 1 per locule, hemispherical, without a groove; endosperm entire, without any adaxial intrusion; embryo half as high as seed; radicle inferior.

Species 9, trop. Africa; sthn trop. Afr. 2, Angola, Zambia.

Atractogyne Pierre

(Cinchonoideae—Gardenieae)

Pierre: 1261 (1896); Hallé: 309 (1962); Hepper & Keay: 158 (1963).

Afrohamelia Wernham; Good: 8 (1926b); Gossweiler & Mendonça: 57 (1939).

Tall lianes with flexible stems. **Leaves** petiolate, ovate, symmetrical, acuminate, base rounded to cordate, with 4–6(7) arcuate-ascending secondary nerves on each side of midrib, puberulous on midrib and nerves beneath; axillary domatia with a small rounded, ciliate opening; interpetiolar stipules small, apiculate, fused into a short tube at base. **Inflorescences** terminal, ± contracted cymes on lateral branches; floral buds elongate, subacute. **Flowers** bisexual or male, protandrous. **Calyx** tubular with 5 pointed lobes. **Corolla** campanulate; lobes 5, ovate, contorted in bud. **Stamens** arising on lower half of corolla tube; filaments very short, attached to lower $^1/_4$ of anther; anthers with or without pollen; connective prolonged beyond thecae; pollen in tedrads. **Disc** annular. **Ovary** 2-locular; ovules many, axile; style slender in basal part, then swollen and furrowed in upper $^3/_4$; stigma 2-lobed, purple, not opening and spreading when non-functional. **Fruit** barrel-shaped with a long peduncle, smooth when ripe, solitary or few in an infructescence; exocarp subcoriaceous; seeds embedded in soft, juicy pulp. **Seeds** many, slightly angular; endosperm present; embryo straight with rounded cotyledons.

Species 2, W Africa; sthn trop. Afr. 1: *Atractogyne bracteata* (Wernham) Hutch. & Dalziel, Angola.

Aulacocalyx Hook.f.

(Ixoroideae—Aulacocalyceae)

Hooker: t. 1126 (1873b); Petit: 3 (1961); Hallé: 154 (1970); Bridson & Verdcourt: 736 (1988); Figueiredo: 637 (1997); Bridson: 227 (1998); White *et al.*: 462 (2001).

Shrubs or trees. **Leaves** petiolate, oblong-elliptic, acuminate to caudate-acuminate, base cuneate to ± cordate, domatia present or absent; stipules narrowly triangular, ± attenuate. **Inflorescences** few- to many-flowered, usually borne on a very short shoot above a single leaf; pedicels short to almost absent. **Calyx** tubular, lobes 5, varying in length. **Corolla** with a slender, pubescent tube, often split along one side, and 5 abruptly spreading lobes. **Stamens** 5; anthers sessile, linear,

usually medifixed, at least partly exserted. **Ovary** 2-locular, each locule with a pendulous placenta with 2–10 embedded ovules; style filiform or elongate-clavate, glabrous or rarely pubescent, undivided or shortly bilobed at apex. **Fruit** fleshy, subglobose, 1- to several-seeded, crowned by cylindric calyx limb. **Seeds** subglobose, with abundant endosperm.

Species 8, trop. Africa; sthn trop. Afr. 2, Angola, Zambia.

Batopedina Verdc.

(Rubioideae—Hedyotideae)

Verdcourt: 29 (1953a); Robbrecht: 174, 186 (1981a); Verdcourt: 82 (1989).

Subshrubs with many branches from a thick woody rootstock, often tufted. **Leaves** opposite but sometimes appearing verticillate, linear to ovate; stipules with 3–5 short lobes from a short base. **Flowers** heterostylous, solitary or paired, axillary or at apices of branchlets. **Calyx**: tube ovoid; lobes unequal, one foliaceous and rest minute or of varying sizes. **Corolla**: tube filiform, enlarged at apex; throat hairy inside; lobes 5, ovate. **Stamens** 5, included or exserted. **Ovary** 2-locular with many ovules; style included or exserted; stigma lobes filiform. **Capsule** ovoid, splitting into 2 cocci. **Seeds** many; testa finely striate.

Species 3, Upper Volta, Ghana, DRC; sthn trop. Afr. 1: *Batopedina linearifolia* (Bremek.) Verdc., in Zambia. Doubtfully distinct from *Otomeria* Benth.

Belonophora Hook.f.

(?Ixoroideae—Aulacocalyceae)

Hooker: t. 1127 (1873c); Keay: 297 (1958b); Bridson & Verdcourt: 728 (1988); Bridson: 225 (1998); Cheek & Dawson: 63 (2000).

Diplosporopsis Wernham; *Kerstingia* K.Schum.

Trees or shrubs resembling *Coffea*. **Leaves** paired; stipules elliptic, lanceolate or triangular, often tapering-subulate, deciduous. **Flowers** sessile, in fascicles on both sides of successive nodes. **Calyx** bracteolate at base; tube campanulate; limb with 5 rounded imbricate lobes. **Corolla** salver-shaped; tube slender, somewhat narrowed at base, adpressed pubescent outside, glabrous at throat; lobes 5, narrowly oblong, contorted to the right as seen in plan view, adpressed puberulous. **Stamens**: anthers sessile, included in corolla tube, linear. **Disc** cushion-shaped. **Ovary** 2-locular, each locule with a pendulous placenta bearing 2 collateral ovules inserted on its inner face; style included, divided into 2 papillose, subulate branches. **Fruits** globose or ellipsoid-globose, 2-locular, with leathery wall, marked at apex with evident remains of disc and calyx lobes. **Seeds** 2–4 per fruit, pendulous; albumen horny; testa apparently absent; embryo with radicle superior.

Species 5, trop. Africa, mainly W; sthn trop. Afr. 1: *Belonophora coffeoides* Hook.f. subsp. *hypoglauca* (Welw. ex Hiern) S.E.Dawson & Cheek (=*B. hypoglauca* (Welw. ex Hiern) A.Chev.), Angola, Zambia.

Bertiera Aubl.

(Cinchonoideae—Gardenieae—Gardeniinae)

Aublet: 180 (1775); Wernham: 110 (1912); Bridson & Verdcourt: 479 (1988); Robbrecht *et al.*: 101 (1993); Bridson: 213, 214, 223 (1998).

Justenia Hiern: 451 (1898); Good: 4 (1926b).

Small trees or shrubs, rarely lianas. **Leaves** shortly petiolate; petioles normally channelled above; blades thin or scarcely coriaceous, mid- and lateral nerves usually prominent beneath; stipules persistent, usually connate above nodes for a short distance. **Flowers** moderate in size or small, borne in terminal, spicate thyrsoid panicles, scorpioid cymes or spherical compact heads. **Calyx** with limb produced above tube, cup-shaped and frequently wider than tube, truncate or 5-toothed or -lobed. **Corolla** with hairy throat, often with walls of tube toughened or thick; tube exceeding calyx-limb; lobes (4)5, usually acuminate or apiculate, contorted in bud. **Stamens**: anthers (4)5, subsessile, attached by very short filaments near base, included, linear, sagittate or bilobed at base, connective extended into an apiculate apex. **Disc** glabrous, fleshy, cup-shaped, or annular. **Ovary** 2-locular with numerous ovules inserted on a thickened placenta; stigma borne on style ± club-shaped, formed from 2 flattened appressed branches (seldom separating), with 10 membranous linear vanes which fit between anthers in bud. **Fruit** indehiscent, ovoid or globose, often coriaceous; calyx persistent; pedicels sometimes accrescent. **Seeds** many, red-brown to black, angular, rugulose or granulose.

Species 55, tropical America and Africa; sthn trop. Afr. 4, Angola, Zambia.

Brenania Keay

(Cinchonoideae—Gardenieae)

Keay: 26 (1958a); Petit: 5 (1961); Hepper & Keay: 116 (1963); Hallé: 255 (1970).

Tall trees, glabrous, young parts glutinous; branchlets stout. **Leaves** petiolate, obovate-oblanceolate, subcordate to cuneate at base, apex rounded and very bluntly and shortly acuminate; stipules united, truncate, ciliate on margin, persistent. **Inflorescences** cymose, ± 50 mm long, borne laterally opposite a single leaf at alternate nodes; axis becoming woody in fruit. **Flowers** glabrous except inside of corolla tube. **Calyx** shortly tubular, truncate or obscurely 5-toothed. **Corolla**: tube cylindrical, lobes 5, suborbicular, contorted. **Stamens** 5; anthers ± included, linear, sessile. **Disc** cup-shaped, glabrous. **Ovary** 1-locular, with 2 parietal placentas and many ovules; style with slightly thickened, 2-lobed stigma. **Fruit** subglobose, glabrous, with thick fleshy mesocarp, and a thick, woody endocarp. **Seeds** many, lenticular, irregularly ovate in outline.

Species 2, tropical W Africa; sthn trop. Afr. 1: *Brenania brieyi* (De Wild.) E.M.A.Petit, Angola (Cabinda).

Breonadia Ridsdale

(Cinchonoideae—Naucleeae)

Ridsdale & Bakhuizen van den Brink: 549 (1975); Bridson & Verdcourt: 443 (1988); Bridson: 223 (1998); White *et al.*: 462 (2001); Coates Palgrave: 1038 (2002).

Adina Salisb.; Good: 1 (1926b); White: 398 (1962).

Monotypic genus: *Breonadia salicina* (Vahl) Hepper & J.R.I.Wood; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Burttdavya Hoyle

(Cinchonoideae—Naucleeae)

Hoyle: t. 3318 (1936); Ridsdale & Bakhuizen van den Brink: 548 (1975);

Bridson & Verdcourt: 443 (1988); Bridson: 223 (1998); White *et al.*: 464 (2001); Msekandiana & Mlangeni: 38 (2002).

Unarmed trees; branches glabrous. **Leaves** paired, petiolate, large, ovate or broadly elliptic; stipules large, elliptic to broadly obovate, deciduous. **Inflorescences** globose, solitary, terminal, with flowers very densely crowded on a ± globose, fleshy, ± pilose receptacle; interfloral bracteoles absent. **Calyx** 5-lobed, lobes free, linear-spathulate, persistent. **Corolla** ± tubular; lobes 5, imbricate. **Stamens**: filaments very short; anthers 2-thecous. **Ovaries** closely contiguous but not fused, each 2-locular; locules with many ovules, placentas attached to middle of septum; style slender, exserted; stigma red, narrowly conical with widened base and blunt tip, sulcate. **Fruiting heads** globose, but individual fruits not joined, red, irregularly breaking, crowned by persistent calyx lobes. **Seeds** not winged, but sometimes angular; testa reticulate; embryo straight, surrounded by albumen.

Monotypic genus: *Burttdavya nyasica* Hoyle, tropical E Africa; sthn trop. Afr.: Malawi, Mozambique.

Calanda K.Schum.

(Rubioideae—Knoxieae)

Schumann: 386 (1903); Good: 20 (1926b) as *Calandra*; Verdcourt: 241 (1958); Verdcourt: 238 (1981a); Puff & Robbrecht: 513, 546 (1989).

Otocephalus Chiov.

Perennial herbs containing raphides. **Leaves** in whorls of 3, sessile, ovate-lanceolate to lanceolate, glabrous; stipules triangular, acute. **Inflorescences**: flowers fused in pairs, crowded into heads arranged in umbel-like terminal inflorescences; bracts present or absent. **Calyx** shared by 2 corollas; sepals only (1)2 per flower, one much longer than the other. **Corolla** funnel-shaped, blue; lobes 5, much shorter than tube. **Stamens** sessile, arising in sinus between corolla lobes. **Ovary**: each flower pair has 2 ovaries, each consisting of 1 fertile locule with 1 pendulous ovule and a reduced sterile carpel; the ovaries of a flower pair are fused by their sterile carpels; both ovaries with a style and 2-lobed stigma. **Fruit** a single subtrigonous, usually slightly curved mericarp from each ovary. **Seeds** with relatively large embryo with foliaceous cotyledons.

Monotypic genus: *Calanda rubricaulis* K.Schum., endemic to Angola.

Calycosiphonia Pierre ex Robbr.

(Cinchonoideae—Gardenieae)

Robbrecht: 370 (1981b); Bridson & Verdcourt: 727 (1988); Bridson: 225 (1998).

Shrubs or small trees. **Leaves** opposite, petiolate, papery to subcoriaceous, glabrous; domatia absent or present in axils of lateral nerves but rather inconspicuous and sparsely ciliate; stipules shortly sheathing, with triangular limbs bearing a subulate to linear caducous lobe, pubescent and beset with colleters inside. **Flowers** bisexual, 7- or 8-merous, axillary with 1–4 flowers borne in each axil, stalked; bracts 2 or 3, cupular or saucer-shaped (referred to as calyculi), usually totally obscuring the pedicel, pubescent and beset with numerous colleters inside, often with linear or subfoliaceous lobes. **Calyx**: tube campanulate, obscured by the calyculi; limb truncate or with rudimentary teeth. **Corolla** white or ?yellow, glabrous outside; tube cylindric below but widening above, slightly shorter than or slightly longer than the lobes; lobes 7 or 8, contorted in bud, spreading. **Stamens** 7 or 8, attached at mouth of corolla tube, exserted, erect; filaments, ± $^1/_3$ as long as anthers; anthers narrowly linear-lanceolate, with thecae transversely divided into cells, apiculate at apex, scarcely hastate at base, attached ± $^1/_3$ of their length from base. **Disc** annular. **Ovary** 2-locular; placentas small, fleshy, attached near middle of septum; ovules 1 or 2, deeply immersed in placenta; style cylindric, slender, glabrous, exceeding corolla tube; stigma exserted, 2-lobed. **Fruit** rather fleshy, 1- or 2-seeded; calyx limb persistent. **Seeds** dark, ± hemispherical; small depression present on apex or on curved face near apex; testa apparently absent, surface smooth to somewhat rugulose at low power magnifications; endosperm dark purplish in colour (preserved material), entire; embryo straight, with radicle inferior.

Species 2, trop. Africa; sthn trop. Afr. 1: *Calycosiphonia spathicalyx* (K.Schum.) Robbr., Angola, Malawi.

Canthium Lam.

(Ixoroideae—Vanguerieae)

Good: 21 (1926b); Dowsett-Lemaire: 109 (1990); Bridson: 861 (1991); Bridson: 353 (1992); Bridson: 315 (1998); White *et al.*: 464 (2001); Coates Palgrave: 1086 (2002); Lantz *et al.*: 179 (2002); Mapaura & Timberlake: 168 (2002).

Plectronia in sense of many authors.

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Carphalea Juss.

(Rubioideae—Hedyotideae)

Verdcourt: 423 (1974); Verdcourt: 82 (1989); Bridson: 223 (1998); Coates Palgrave: 1036 (2002).

Dirichletia Klotzsch; White: 406 (1962).

Sthn trop. Afr. 1: *Carphalea pubescens* (Klotzsch) Verdc., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Catunaregam Wolf

(Cinchonoideae—Gardenieae—Gardeniinae)

Bridson & Verdcourt: 496 (1988); Bridson: 224, 226 (1998); Coates Palgrave: 1049 (2002).

Xeromphis Raf.; White: 425 (1962).

Sthn trop. Afr. 1: *Catunaregam spinosa* (Thunb.) Tirveng., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cephalanthus L.

(Cinchonoideae—Cephalantheae)

Ridsdale: 179 (1976); White *et al.*: 472 (2001); Coates Palgrave: 1039 (2002).

Sthn trop. Afr. 1: *Cephalanthus natalensis* Oliv., Zimbabwe, Malawi, and sthn Afr.

Chassalia Comm. ex Poir.

(Rubioideae—Psychotrieae)

Poiret: 450 (1812); Verdcourt: 270 (1975); Verdcourt: 120 (1976); Verdcourt: 38 (1989); Bridson: 221, 224 (1998); White *et al.*: 472 (2001); Coates Palgrave: 1129 (2002); Mapaura & Timberlake: 168 (2002) as *Chasalia*.

Myristiphyllum P.Browne, in part; Hiern: 493 (1898).

Shrubs or less often small trees or subshrubby herbs, with mostly glabrous or only finely pubescent stems. **Leaves** opposite or rarely ternate, mostly acuminate, usually quite thin, shortly to distinctly petiolate, usually glabrous; stipules interpetiolar, ovate to triangular or quite short and broad, sometimes united into a small sheath, entire or with 2 short fimbriae, often with colleters and hairs within the base, mostly persistent. **Flowers** bisexual, 4- or 5-merous, heterostylous, mostly small, in branched panicles, the ultimate elements usually being small heads but in a few species flowers pedicellate; bracts small. **Calyx**: tube mostly ovoid or oblong, ribbed, free limb mostly very short; lobes triangular or linear but mostly very short. **Buds** often winged. **Corolla** white, pink or purple, sometimes yellow inside; tube cylindric, hairy or glabrous inside; lobes often winged; venation of corolla often curiously prominent in dry material. **Stamens** included or exserted. **Disc** cylindric, distinct. **Ovary** 2-locular; ovules solitary in each locule, erect from base; style included or exserted; stigma lobes linear. **Fruits** succulent, with 2 pyrenes; pyrenes pale, semiglobose or semi-ellipsoid, ventral surface often grooved, often with a median dorsal keel along which dehiscence takes place. **Seeds** concavo-convex, with a pale testa; endosperm not ruminate.

Species ± 45, mostly trop. Africa and Madagascar, extending east as far as Philippines; sthn trop. Afr. 3, Angola, Zambia, Malawi, Mozambique. Closely allied to *Psychotria*.

Chazaliella E.M.A.Petit & Verdc.

(Rubioideae—Psychotrieae)

Petit & Verdcourt: 268 (1975); Verdcourt: 785 (1977); Verdcourt: 35 (1989); Bridson: 224 (1998); Coates Palgrave: 1126 (2002).

Psychotria L., in part.

Shrubs, often flowering before leaves are fully developed; stems usually 2-ribbed, all but youngest shoots usually covered with pale brown soft cork. **Leaves** opposite or in whorls of 3 or 4, mostly drying pale, petiolate or subsessile, usually deciduous; nodules 0; domatia small, white-pubescent or absent; stipules mostly short, ovate or triangular, entire, bifid or sometimes with a few teeth. **Flowers** bisexual, small, heterostylous, (4)5(6)-merous, in mostly small, sessile or pedunculate inflorescences, often in small heads, or sometimes paniculate, sessile or pedicellate; bracts and bracteoles very small or absent. **Calyx**: limb usually short, truncate or toothed. **Corolla** mostly yellow or white; tube shortly cylindric, hairy at throat; lobes triangular to elliptic-lanceolate, always valvate. **Stamens** with long filaments in short-styled flowers and shorter filaments in long-styled flowers; anthers included or only tips exserted. **Ovary** 2-locular, each locule containing a single erect ovule; style filiform, usually papillate-pubescent, divided into 2 thick stigma lobes. **Fruit** a drupe with 2 pyrenes; pyrenes flat ventrally, mostly 3-ribbed or 3-lobed dorsally, opening by 2 slits extending along margins of ventral face for ± $^1/_2$ its length. **Seeds** pale; endosperm not ruminate.

Species 25, trop. Africa; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Coddia Verdc.

(Cinchonoideae—Gardenieae—Gardeniinae)

Verdcourt: 493 (1981b); Bridson: 226 (1998); Coates Palgrave: 1050 (2002).

Monotypic genus: *Coddia rudis* (E.Mey. ex Harv.) Verdc.; sthn trop. Afr.: Zimbabwe, Mozambique, and sthn Afr.

Coffea L.

(Cinchonoideae—Coffeeae)

Good: 27 (1926b); Bridson: 817 (1982); Bridson & Verdcourt: 703 (1988); Bridson: 331 (1994); Bridson: 215, 225 (1998); White *et al.*: 474 (2001); Bingham & Smith: 143 (2002); Coates Palgrave: 1106 (2002); Mapaura & Timberlake: 168 (2002).

Species 90, trop. Africa to Mascarenes; sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Conostomium (Stapf) Cufod.

(Rubioideae—Hedyotideae)

Bremekamp: 125 (1952b); Verdcourt: 242 (1976); Verdcourt: 101 (1989); Bridson: 218 (1998); Izidine & Bandeira: 52 (2002).

Sthn trop. Afr. 3, Zimbabwe, Mozambique, and sthn Afr.

Coptosperma Hook.f.

(Cinchonoideae—Paveetteae)

Hooker: 86 (1873a); De Block *et al.*: 455 (2002); Degreef *et al.*: 367 (2002).

Tarenna Gaertn. in part, as to spp. with 1-locular fruit with 1 seed with ruminate endosperm; Bridson: 377 (1979b).

Shrubs to medium-sized trees. **Leaves** subcoriaceous to strongly coriaceous, puberulous to glabrous; tip often acute to obtuse; petioles mostly shorter than 3 mm, but may be up to 30 mm; stipules triangular to duck bill-shaped, never drying black. **Inflorescences** terminal or axillary, many-flowered; partial inflorescences generally ± compact; bracts present; bracteoles scale-like, triangular to ovate, glabrous or ciliate, usually at base of ovary. **Flowers** generally 5-merous but few species with both 4- and 5-merous flowers, usually small. **Calyx** short, usually glabrous; lobes triangular, ± as long as tube, or tube ± truncate. **Corolla**: tube shorter than 10 mm; lobes usually shorter than 10 mm, usually glabrous outside, contorted. **Stamens** with anthers exserted from corolla tube. **Ovary** with 1–4(–8) ovules, pendulous or ascending from a small placenta or impressed in a large placenta. **Fruit** drupaceous, 1-locular, brown or sometimes red turning black. **Seeds** 1(2), suborbicular to ellipsoid; hilum irregular or rarely round; annulus absent; endosperm ruminate, at least around hilum.

Species ± 50, if *Enterospermum* Hiern and *Zygoon* Hiern are included; Madagascar and continental Africa; sthn trop. Afr. 6, ?Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Corynanthe Welw.

(Cinchonoideae—Coptosapelteae)

Welwitsch: 37 (1869); Hallé: 60 (1970); Robbrecht: 175 (1993); Stoffelen & Robbrecht: 301 (1996).

Trees with strictly decussate branching. **Leaves** petiolate, obovate or elliptic, secondary nerves prominent; domatia usually present; stipules interpetiolar, caducous, colleters inserted parallel with outer margin of stipules. **Inflorescences** axillary or terminal, thyrsic, ± loose but terminal flowers subcapitate. **Flowers** 4(5)-merous. **Calyx** with short tube and triangular to rounded lobes, often with 1 or 2 colleters in sinuses. **Corolla**: tube trumpet-shaped; lobes valvate, ± as long as tube, with cowl-shaped tip and a long, linear to narrowly club-shaped subapical appendage. **Stamens**: anthers exserted, sagittate, medifixed; filaments short, arising between bases of corolla lobes. **Ovary** 2-locular; placenta fleshy, pendulous, bearing many upwardly imbricate ovules; style far exserted, glabrous; stigma ovoid to spherical, undivided. **Fruit** an elongated capsule loculicidally dehiscent from top and slightly septicidal, with persistent calyx. **Seeds** with striking membranous wing narrowly triangular at apex, forked like a swallow tail at base.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola.

Craterispermum Benth.

(Rubioideae—Psychotrieae)

Bentham: 411 (1849); Verdcourt: 433 (1973b); Verdcourt: 161 (1976); Verdcourt: 53 (1989); Robbrecht: 171 (1994); Bridson: 224 (1998); White *et al.*: 474 (2001); Coates Palgrave: 1104 (2002).

Glabrous trees or shrubs mostly with yellow-green foliage. **Leaves** opposite, petiolate, blades mostly oblong or elliptic, often coriaceous; venation mostly closely reticulate; stipules intrapetiolar, broad, connate to form a tube, made up of 2 triangular parts joined by thinner tissue, undivided, persistent or deciduous. **Flowers** bisexual, heterostylous, 5-merous, in small subcapitate or somewhat elongated, occasionally 2-branched cymes; peduncles short or less often long and slender, strongly compressed, axillary or more usually supra-axillary; bracteoles present. **Calyx**: tube obconic or turbinate; limb cupular, truncate, sinuate or shortly 5-dentate, persistent. **Corolla** salver-shaped or somewhat funnel-shaped with short or elongated tube and densely hairy or less often glabrous throat. **Stamens** either included in throat or exserted; anthers linear-oblong, dorsifixed. **Disc** annular, thick. **Ovary** 2-locular; ovules solitary in each locule, pendulous from apex; style filiform; stigma divided into 2 linear, papillate branches or fusiform, bifid. **Fruit** subglobose, pea-like, sessile or pedicellate, 1(2)-locular, 1-seeded; endocarp chartaceous. **Seeds** pendulous, hemispherical or almost bowl-shaped, dorsally convex, ventrally deeply excavated; albumen fleshy; embryo small with a superior radicle.

Species 15–20, widespread in trop. Africa and also in the Seychelles and Madagascar; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Cremaspora Benth.

(Cinchonoideae—Cremasporeae)

Bentham: 412 (1849); Verdcourt: 131 (1980b); Bridson & Verdcourt: 733 (1988); Bridson: 214, 225 (1998); White *et al.*: 475 (2001); Coates Palgrave: 1073 (2002).

Shrubs, small trees or sometimes lianes or with subscandent branches; stems and foliage almost glabrous to densely hairy; branches appearing supra-axillary and often supported by rounded leaves very different from the main foliage. **Leaves** opposite, shortly petiolate, mostly thinly coriaceous, mostly oblong-elliptic; stipules keeled, acuminate, soon deciduous. **Flowers** sweetly scented, rather small, in sessile, mostly dense axillary clusters; bracts and bracteoles triangular-acuminate, not forming cupules. **Calyx**: tube ovoid; limb campanulate with 5 triangular to lanceolate teeth. **Corolla** white, cylindrical or very narrowly funnel-shaped, glabrescent or pubescent outside, glabrous to pilose at throat; lobes 5, narrowly oblong, ± obtuse or acute, strictly contorted, pubescent outside. **Stamens** 5, inserted at mouth of tube; filaments very short; anthers buff, dorsifixed, linear, apiculate, ± bifid at base, fully exserted. **Disc** shallowly bowl-shaped, becoming more cylindric in fruit. **Ovary** 2-locular, with a single ovule in each locule, pendulous from apex; style green, filiform, exserted, hairy save at extreme base, the apical 1 mm divisible into 2 lobes which do not spread and bear the stigmatic surface on their inner faces. **Fruit** ovoid, indehiscent, leathery-walled, 2-locular, (1)2-seeded. **Seeds** half-ovoid, compressed, rugulose; testa characteristically finely transversely wrinkled-striate; albumen horny, not ruminate; embryo small with inferior radicle; placenta elongated, lying along whole side of seed.

Species 2, trop. Africa; sthn trop. Afr. 1: *Cremaspora triflora* (Thonn.) K.Schum., Angola, Zimbabwe, Malawi, Mozambique.

Crossopteryx Fenzl

(Cinchonoideae—Coptosapelteae)

Bridson & Verdcourt: 455 (1988); Robbrecht: 175 (1993); Bridson 212, 227 (1998); Coates Palgrave: 1038 (2002).

Sthn trop. Afr. 1: *Crossopteryx febrifuga* (Afzel. ex G.Don) Benth., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cuviera DC.

(Ixoroideae—Vanguerieae)

Candolle: 222 (1807) name conserved; Hepper & Keay: 176 (1963); Verdcourt: 497 (1979a); Verdcourt: 770 (1991); Bridson: 301 (1998); Lantz *et al.*: 181 (2002).

Small trees or shrubs, unarmed or sometimes spinose. **Leaves** opposite, often large, mostly ± oblong or elliptic, petiolate, usually coriaceous and persistent; stipules small, basally ± connate, often acuminate, deciduous. **Flowers** bisexual or sometimes sterile, in subsessile or pedunculate, many-flowered axillary cymes; bracts and bracteoles linear to lanceolate or elliptic, often leaf-like and accrescent. **Calyx**: tube obconic or turbinate, sometimes 3- or 4-angled; limb tube ± suppressed; lobes 3–6, linear to ovate, often leaf-like and accrescent, mostly longer than corolla, persistent. **Corolla** funnel-shaped, campanulate or barrel-shaped, retrorsely hairy or bristly inside but throat glabrous, outside glabrous or pilose; lobes 5 or 6, spreading or reflexed, elongate, mostly caudate-acuminate, sometimes very markedly so. **Stamens** 5, arising in throat; anthers exserted. **Disc** depressed, lobed. **Style** thick, narrowed at both ends, stiffly pubescent to glabrous, sometimes with a conspicuous globular swelling near base; pollen presenter cylindric, mitriform or peltate, 2–10-grooved. **Ovary** (1)2–5-

locular; ovules solitary in each locule, pendulous. **Fruit** drupaceous, often large, ovoid or subglobose, sometimes obscurely angled, with 1–5, 1-seeded pyrenes.

Species ± 20, trop. Africa, mostly western and central; sthn trop. Afr. 4, Angola, Malawi, Mozambique.

Dictyandra Welw. ex Hook.f.

(Cinchonoideae—Pavetteae)

Hooker: 85 (1873a); Hiern: 456 (1898); Good: 9 (1926b); Hallé: 86 (1970); Robbrecht: 108 (1984); Bridson & Verdcourt: 686 (1988).

Shrubs or small trees. **Leaves** opposite, petiolate, with domatia; stipules flattened, triangular and erect or rounded and bent back. **Flowers** bisexual, 5-merous, pedicellate, in terminal corymbs. **Calyx**: tube ovoid or turbinate; tubular part of limb short; lobes ± erect, contorted. **Corolla** with tube about equalling lobes; lobes narrowly lanceolate, contorted. **Stamens**: anthers exserted, subsagittate, thecae simple, or locellate with 4 vertical lines of small compartments. **Ovary** 2-locular, thick-walled, with an ovate peltate placenta covered with very many ovules; style rather thick, with an exserted bilobed stigma. **Fruit** globose or ellipsoid, crowned with persistent calyx lobes. **Seeds** squarish, angular, small, black, shining and smooth, with a hilar pit.

Species 2, tropical W Africa; sthn trop. Afr. 1: *Dictyandra arborescens* Hook.f., Angola.

Didymosalpinx Keay

(Cinchonoideae—Gardenieae)

Keay: 61 (1958a); Bridson & Verdcourt: 523 (1988); Coates Palgrave: 1060 (2002); Robbrecht & De Block: 165 (2002).

Gardenia in sense of Swynnerton: 80 (1911).

Erect or scrambling shrubs, entirely glabrous (except inside of corolla tube); some lateral branches modified into paired, straight supra-axillary spines held at right angles. **Leaves** opposite, petiolate, ± elliptic, usually with small ciliate pit domatia; stipules subulate, slightly connate at base. **Flowers** bisexual, rather large, 5-merous, axillary or supra-axillary, solitary on both sides of node, sweetly scented at night; pedicels well-developed. **Calyx**: tube short, with colleters inside; lobes narrowly triangular. **Corolla** funnel-shaped with strong midpetaline nerves, pilose inside, glabrous outside; lobes ovate-triangular, much shorter than tube. **Anthers** included, sessile in uppermost portion of tube. **Ovary** 1-locular with 2 opposing parietal placentas which may be ± joined to form a ± 2-locular ovary; ovules deeply embedded in placentas. **Fruit** globose or ellipsoid, slightly ribbed, crowned with persistent calyx; testa thin, leathery. **Seeds** 10–15, lenticular, embedded in pulpy placental tissue.

Species 4, trop. Africa, 3 in W, 1 in E and SE; sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique.

Diodia L.

(Rubioideae—Spermacoceae)

Hepper & Keay: 216 (1963); Verdcourt: 162 (1989); Bridson: 220 (1998).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Euclinia Salisb.

(Cinchonoideae—Gardenieae)

Salisbury: t. 93 (1808); Keay: 39 (1958a); Hallé: 204 (1970); Bridson & Verdcourt: 495 (1988).

Randia L., in part.

Deciduous small shrubs or trees; branches with very unequal internodes, some slender and elongated, others at apices very condensed; petiolar scars prominent **Leaves** opposite, petiolate, tufted at ends of shoots; blades thin, with pubescent domatia; stipules scarious, persistent. **Flowers** fragrant, solitary, terminal, 5(6–8)-merous, surrounded at base by scarious scales. **Calyx**: tube cylindric-turbinate; free tubular part of limb very short; lobes elongate, persistent. **Corolla** turning black on drying: tube short to very long, cylindric, apical part narrowly to broadly funnel-shaped, tube pubescent towards base; lobes contorted, overlapping to the left. **Stamens** sessile, apices of anthers just about reaching mouth of throat; pollen grains in tetrads, golden yellow. **Ovary** with 2 placentas forming 2 locules; ovules many; style swollen into an ellipsoid swelling at level of anthers with 2 closely adnate stigmatic lobes. **Fruit** globose or pyriform, crowned with persistent calyx lobes; peduncle accrescent. **Seeds** irregularly lenticular, compressed.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola.

Fadogia Schweinf.

(Ixoroideae—Vanguerieae)

Good: 23 (1926b); Verdcourt: 786 (1991); Bridson: 265 (1998); Bingham & Smith: 143 (2002); Lantz *et al.*: 182 (2002).

Temnocalyx Robyns, in part; White: 422 (1962).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Fadogiella Robyns

(Ixoroideae—Vanguerieae)

Robyns: 94 (1928); Verdcourt: 784 (1991); Bridson: 347, 350 (1996); Bridson: 282 (1998); Lantz *et al.*: 173 (2002).

Subshrubby herbs (suffrutices) or shrubs, completely softly tomentose, mostly much branched. **Leaves** opposite, or less often in whorls of 3, shortly petioled; stipules with triangular or sheathing connate bases and subulate appendages. **Flowers** relatively large, in subsessile or shortly pedunculate, dense, few- to many-flowered cymes. **Calyx**: tube globose with a short ± subundulate limb or short, triangular teeth. **Corolla** thick, cylindric or obovoid, obtuse or shortly acuminate at apex in bud; mostly yellow or greenish, densely tomentose; tube cylindric, glabrous or hairy at throat, with a ring of deflexed hairs inside; lobes reflexed, obtuse or shortly apiculate. **Stamens** inserted at throat; anthers exserted or partly exserted. **Ovary** (3)4- or 5-locular, each locule with a pendulous ovule; style slender, exserted; pollen presenter cylindric or coroniform, sulcate, (3)4- or 5-lobed at apex. **Fruit** drying black, globose, crowned with calyx limb, sometimes ribbed, containing (3)4 or 5 pyrenes, ± glabrous. **Pyrenes** thinly woody, not crested around apex, point of attachment ± beaked, very slightly textured. **Cotyledons** very much shorter than radicle.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Malawi.

Feretia Delile

(Ixoroideae—Oetotropideae)

Bridson: 225 (1998); Bridson & Verdcourt: 696 (1988); Coates Palgrave: 1063 (2002).

Sthn trop. Afr. 1: *Feretia aeruginescens* Stapf, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gaertnera Lam.

(Rubioideae—Psychotrieae)

Lamarck: 273 (1792); Verdcourt: 42 (1989); Malcomber: 42 (2002).

Usually glabrous evergreen trees and shrubs. **Leaves** opposite, mostly distinctly petiolate, often rather coriaceous; stipules intrapetiolar, joined, sheath distinctly leafy or truncate or with 4–many setae. **Inflorescences** cymose, terminal, usually many-flowered, capitate to laxly paniculate; bracts and bracteoles present, the latter often adnate to calyx. **Flowers** often (but apparently not always) heterostylous but not always with anthers well-exserted. **Calyx**: tube globose, obovoid or ovoid, limb campanulate, truncate or 5-lobed. **Corolla** mostly sweet-scented, funnel-shaped or salver-shaped; tube usually elongate and cylindric but sometimes shorter than limb; lobes 5, valvate. **Stamens** inserted beneath throat; anthers linear, included. **Ovary** superior, 2-locular with one erect ovule in each locule; style filiform, sometimes thickened and puberulous towards apex, with 2 linear stigmatic lobes. **Fruit** globose, obovoid, oblong-ellipsoid or fusiform, smooth or ribbed, indehiscent, fleshy. **Pyrenes** and seeds similarly shaped, globose to fusiform; albumen copious; embryo small, erect.

Species ± 45, trop. Africa, Madagascar, further east to Australia; sthn trop. Afr. 2, Angola, Zambia.

Galiniera Delile

(Ixoroideae—Hypobathreae)

Delile: 92 (1843); Bridson & Verdcourt: 694 (1988); Bridson: 225 (1998); White *et al.*: 475 (2001).

Shrubs or small trees; branches glabrous or pubescent. **Leaves** opposite, petiolate; domatia present or absent; stipules triangular. **Flowers** bisexual, sweetly scented, 5-merous, pedicellate in pedunculate axillary cymes; bracts and bracteoles present. **Calyx** glabrous or pubescent; tube extremely short; lobes ovate. **Stamens** arising at top of corolla tube, exserted and spreading when mature; filaments short; anthers dorsifixed near base, narrowly oblong, with distinctly apiculate connective. **Disc** annular. **Ovary** 2-locular; placentas small, attached near top of locules, bearing 2 pendulous ovules or rarely one ovule on a larger placenta; style short, subulate, pubescent; stigmatic club deeply bifid, but two halves often held together; 5 membranous ciliate wings present on each lobe. **Fruit** fleshy, globose, 2-locular; calyx limb persistent. **Seeds** (2–)4 per fruit, ± $^1/_4$(–$^1/_2$)-spherical, finely reticulate; endosperm ruminate; placenta forming a small aril-like structure at apex of pair of seeds.

Species 2, trop. Africa, Madagascar; sthn trop. Afr. 1: *Galiniera saxifraga* (Hochst.) Bridson, Zambia, Malawi.

Galium L.

(Rubioideae—Rubieae)

Verdcourt: 383 (1976); Puff: 361 (1979); Puff: 195 (1989).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Galopina Thunb.

(Rubioideae—Anthospermeae)

Puff: 427 (1986); Verdcourt: 160 (1989).

Sthn trop. Afr. 1: *Galopina circaeoides* Thunb., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ganguelia Robbr.

(Ixoroideae—Gardenieae—Gardeniinae)

Robbrecht *et al.*: 21 (1996).

Oxyanthus DC. in part as to *O. gossweileri* S.Moore.

Geofrutices with massive woody underground parts and tender, hardly branched supraterranean twigs; ± all parts densely covered with long soft hairs. **Leaves** suborbicular, coriaceous to almost succulent, apex ± emarginate, base widely cuneate; venation subpalmate; petiole slender; stipules interpetiolar, ovate with acute tip, free to base and not sheathing. **Inflorescence**: flowers solitary, pseudo-axillary; bracteoles ovate with acute tip. **Flowers** with left-contorted aestivation. **Calyx** long-tubular; lobes 5, narrowly triangular. **Corolla**: tube slender; lobes 5, narrow, ± $^1/_2$ as long as tube. **Stamens**: anthers 5, sessile in uppermost part of corolla tube, with small, narrowly triangular, sterile apical appendage; pollen in tetrads. **Ovary** 2-locular, with 2 peltate axile placentas with many ovules adnate to ± entire septum; style slightly surpassing anthers, almost thread-like but upper part slightly swollen, terminating in 2 short, papillar stigmatic lobes. **Fruit** unknown.

Monotypic genus: *Ganguelia gossweileri* (S.Moore) Robbr., endemic to south-central Angola.

Gardenia J.Ellis

(Cinchonoideae—Gardenieae—Gardeniinae)

Good: 14 (1926b); Verdcourt: 345 (1979b); Bridson & Verdcourt: 500 (1988); Bridson: 226 (1998); White *et al.*: 475 (2001); Coates Palgrave: 1051 (2002); Mapaura & Timberlake: 168 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Geophila D.Don

(Rubioideae—Psychotrieae)

Don: 136 (1825) conserved name; Hiern: 498 (1898); Good: 37 (1926b); Verdcourt: 320 (1973a); Verdcourt: 109 (1976); Verdcourt: 32 (1989); Bridson: 220 (1998).

Perennial forest floor herbs, mostly with slender creeping stems rooting at nodes. **Leaves** opposite, with mostly long petioles; blades ovate-cordate to rounded-reniform; stipules interpetiolar, ovate, entire or bilobed at apex. **Flowers** bisexual, sometimes heterostylous, mostly in terminal umbels or sometimes solitary, often on long peduncles held erect from main stems, occasionally with an involucre of quite conspicuous

bracts. **Calyx**: tube obovoid, limb short, 5–7-lobed; lobes subulate or linear, spreading or reflexed, persistent. **Corolla** cylindric or funnel-shaped; lobes 4–7, spreading or recurved; throat pilose inside. **Stamens** 4–7, arising in corolla tube; filaments filiform; anthers dorsifixed, included or exserted. **Disc** swollen. **Ovary** 2-locular; ovules solitary in each locule, erect from base, anatropous; style slender, included or exserted; stigma lobes 2, linear, densely papillate or stigma subcapitate-bifid. **Fruit** a drupe, fleshy, containing 2 pyrenes; pyrenes plano-convex, dorsally compressed, obtusely ribbed, rugulose and often with an annular area at junction of ventral and dorsal surfaces, 1-seeded. **Seed**s same shape as pyrenes, ventral surface plane; testa membranous; endosperm corneous.

Species ± 15, tropics of Old and New World; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Guettarda L.

[?(Antirheoideae—Guettardeae)]

Bridson: 923 (1991); Bridson: 223 (1998); Coates Palgrave: 1106 (2002).

Sthn trop. Afr. 1: *Guettarda speciosa* L., Mozambique, and sthn Afr.

Hallea J.-F.Leroy

(Cinchonoideae—Coptosapelteae)

Leroy: 66 (1975); Bridson & Verdcourt: 447 (1988); Robbrecht: 175 (1993); Bridson: 223 (1998); Bingham & Smith: 143 (2002).

Mitragyna Korth., in part; Hallé: 32 (1970); Ridsdale: 43 (1978); White *et al.*: 479 (2001).

Tall trees, sometimes with small, knee-like pneumatophores; bark grey to brown, irregularly cracked and flaking; branchlets often 4-angled, glabrous or hairy. **Leaves** large, petiolate, oblong to elliptic, to broadly ovate, entire, with small domatia, glabrous above, mostly hairy beneath. **Inflorescences** terminal and/or axillary, of 3–many dense spherical heads with pubescent receptacles, flowering branches developing monopodially; bracteoles linear-spathulate, surrounding the free, sessile flowers; buds pubescent at apex. **Calyx** tubular, limb truncate or distinctly lobed; epicalyx sometimes present. **Corolla**: tube funnel-shaped, glabrous; lobes erect, pubescent outside, terminated by short, subulate, glabrous, deciduous appendages. **Anthers** included. **Ovaries** free, 2-locular; ovules many, ascending and imbricate on subpeltate placentas; style distinctly exserted, pollen presenter ovoid or mitriform. **Fruit** dry, dehiscing septicidally, endocarp splitting into two valves, each with rounded lobes. **Seeds** small, with winged margin.

Species 3, trop. Africa; sthn trop. Afr. 2 or 3, Angola, Zambia, Malawi.

Hedythyrsus Bremek.

(Rubioideae—Hedyotideae)

Bremekamp: 149 (1952b); Verdcourt: 105 (1989).

Small erect shrubs, invariably turning blackish on drying and with distinctly discolorous leaves. **Leaves** very shortly petiolate, elliptic to lanceolate, rather thick, closely placed, lateral nerves invisible or very obscure; stipule-sheath usually hairy, divided into several subulate fimbriae. **Flowers** heterostylous, small in many-flowered, dense, terminal corymbs or panicles. **Calyx**: lobes 4, triangular or lanceolate, often with fimbriae between. **Corolla** shortly subcylindric, slightly widened above; lobes 4; throat glabrous or sparsely hairy inside. **Stamens** well exserted in short-styled flowers. **Ovary** 2-locular; ovules few on peltate placentas; style filiform; stigma lobes subglobose. **Capsule** depressed hemispherical, produced into a conical beak which splits loculicidally and septicidally into 4 diverging valves. **Seed**s few, much compressed, elliptic or oblong, sometimes subangular and often slightly winged at both ends or all round, reticulate.

Species 2, very closely allied, upland trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Malawi.

Heinsenia K.Schum.

(Ixoroideae—Aulacocalyceae)

Schumann: 453 (1897); Bridson & Verdcourt: 730 (1988); Bridson: 227 (1998); Coates Palgrave: 1072 (2002).

Aulacocalyx Hook.f. subgen. *Heinsenia* (K.Schum.) Verdc.

Trees or shrubs with branching similar to that of many *Rothmannia* species and characteristic evergreen foliage. **Leaves** opposite, petiolate, thinly coriaceous, usually with ± transversely parallel venation; domatia absent or present and pubescent; stipules triangular, acute or acuminate, soon falling. **Inflorescences** 1–several- or occasionally ± many-flowered on very short terminal branchlets subtended by a single leaf but often lateral and pseudoaxillary owing to sympodial growth of stem; bracts small. **Calyx**: tube ovoid to tubular; limb shortly cylindric, with 5 triangular to lanceolate teeth. **Corolla** ± pubescent to densely adpressed silky outside, narrowly campanulate; lobes 5, ovate to lanceolate. **Stamens**: anthers linear, elongate, apiculate, sessile, usually medifixed, included or slightly to completely exserted; pollen grains simple. **Ovary** 2-locular; each locule with a pendulous placenta carrying 2–10 embedded ovules; style filiform or elongate-clavate, glabrous or rarely pubescent, apical part sometimes 10-ribbed, and divisible into lobes up to 4–5 mm long bearing stigmatic surfaces; the whole style is divisible almost to the base if pulled gently. **Fruit** fleshy, 1–several-seeded, subglobose, crowned by persistent calyx limb. **Seeds** subglobose with abundant endosperm, apparently devoid of a testa; embryo with radicle superior.

Monotypic genus: *Heinsenia diervilleoides* K.Schum., trop. Africa; sthn trop. Afr.: Zimbabwe, Malawi, Mozambique.

Heinsia DC.

(Cinchonoideae—Mussaendeae)

Candolle: 390 (1830); Hallé: 131 (1970); Bridson & Verdcourt: 476 (1988); Bridson: 213, 226 (1998); Coates Palgrave: 1072 (2002); Phiri (Unpublished).

Species 4, trop. Africa; sthn trop. Afr. 2, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hymenocoleus Robbr.

(Rubioideae—Psychotrieae)

Robbrecht: 274 (1975); Robbrecht: 3 (1977); Verdcourt: 113 (1976).

Stoloniferous creeping herbs rooting at nodes, with erect flowering branches, or sometimes erect shrubs. **Leaves** opposite, in 2–6 pairs on flowering stems; stipules bifid at apex or divided into 2 completely separate lobes; a membranous cylindric or cupular sheath present at nodes inside stipules. **Inflorescences** terminal or rarely axillary, ± capitate, often with a cup-like involucre. **Flowers** sessile or subsessile, 5-merous, distinctly or obscurely heterostylous. **Corolla**: funnel-shaped. **Stamens** arising in middle of corolla tube; anthers linear or oblong. **Ovary** 2-locular with a single erect ovule per locule; style bifid. **Fruit** depressed-globose, usually orange, sometimes red, inflated, full of watery juice, crowned with persistent calyx; pyrenes 2, semi-ellipsoid, brittle, dorsal face convex and not ribbed, ventral face with 1 or 2 grooves, basally dehiscent by 2 short lateral fissures. **Seeds** semi-ellipsoid, with entire albumen.

Species 12, trop. Africa; sthn trop. Afr. 3, Angola.

Hymenodictyon Wall.

(Cinchonoideae—Coptosapelteae)

Wallich: 148 (1824); Bridson & Verdcourt: 452 (1988); Robbrecht: 175 (1993); Bridson: 223 (1998); White *et al.*: 477 (2001); Coates Palgrave: 1036 (2002).

Species 20, Old World, E as far as Sulawesi; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hyperacanthus E.Mey. ex Bridson

(Cinchonoideae—Gardenieae—Gardeniinae)

Bridson & Robbrecht: 275 (1985); Bridson: 224, 227 (1998); Coates Palgrave: 1059 (2002).

Species 2, SE Africa; sthn trop. Afr. 2, Zimbabwe, Mozambique, and sthn Afr.

Ixora L.

(Cinchonoideae—Pavetteae)

Linnaeus: 110 (1753); Bridson & Verdcourt: 610 (1988); Bridson: 227 (1998); De Block: 1 (1998); White *et al.*: 477 (2001); Coates Palgrave: 1124 (2002).

Shrubs or small trees. **Leaves** opposite or rarely ternate, sessile or petiolate; blades usually entirely glabrous, less often pubescent beneath, very rarely puberulous above; domatia and bacterial nodules absent; stipules with a truncate to triangular limb, usually connate for most of the length, bearing a short or long, cuspidate or aristate lobe. **Flowers** bisexual, usually fragrant, 4(5)-merous, few to many, usually borne in triads in terminal, sessile to long-pedunculate ± lax cymes or rarely spherical heads; branches of inflorescence opposite and articulate or less often absent; pedicels present or absent; bracts stipule-like; bracteoles present or rarely absent. **Calyx** often reddish in colour, glabrous to shortly pilose or less often pubescent; tube ovoid; limb short, sometimes almost absent, usually as wide as tube, truncate or more usually 4(5)-toothed, shortly lobed or occasionally with well-developed lobes. **Corolla** white, yellow, pink or red, glabrous outside or rarely pilose; tube cylindric, usually slender, only slightly widened at throat, naked or somewhat bearded at throat; lobes contorted in bud, spreading or reflexing, lanceolate, narrowly elliptic or ovate, much shorter than or occasionally equalling the tube in length. **Stamens** arising at mouth of tube, exserted and spreading or erect in mature flowers; filaments very short; anthers attached near base, linear, apiculate and sagittate, twisted when dehisced. **Disc** annular, fleshy. **Ovary** 2-locular, small; placentas fleshy attached near top of septum; ovules solitary, immersed in placentas; style slender, equalling or slightly exceeding corolla tube, glabrous or sometimes pilose; stigma exserted, 2-lobed; lobes always completely separate when mature, usually recurved, equalling or a little shorter than anthers. **Fruit** a drupe, usually red (dull brown in dry specimens), spherical or 2-lobed, slightly fleshy or coriaceous, containing 1 or 2, 1-seeded, thin-walled pyrenes; calyx limb persistent. **Seeds** frequently undeveloped, rusty brown in colour, hemispherical with a deep circular excavation in centre of the plane ventral face, convex dorsal face not sculptured but sometimes with minute protuberances which are occasionally shiny; endosperm entire, cartilaginous; embryo dorsal, curved; cotyledons foliaceous; radicle pointing downwards.

Species ± 300, tropics, ± 40 in Africa; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Keetia E.Phillips

(Ixoroideae—Vanguerieae)

Bridson: 965 (1986); Bridson: 909 (1991); Bridson: 362 (1998); Coates Palgrave: 1100 (2002); Lantz *et al.*: 183 (2002).

Plectronia in part.

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Kohautia Cham. & Schltdl.

(Rubioideae—Hedyotideae)

Bremekamp: 56 (1952b); Verdcourt: 228 (1976); Mantell: 85 (1989).

Sthn trop. Afr. ± 21, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Kraussia Harv.

(Ixoroideae—Octotropideae)

Mogg: 153 (1958); Bridson & Verdcourt: 700 (1988); Bridson: 773 (1995); Bridson: 225 (1998).

Sthn trop. Afr. 1: *Kraussia floribunda* Harv., Mozambique, and sthn Afr.

Lagynias E.Mey. ex Robyns

(Ixoroideae—Vanguerieae)

Bridson: 351 (1996); Bridson: 238 (1998); Coates Palgrave: 1084 (2002); Lantz *et al.*: 173 (2002).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Lasianthus Jack

(Rubioideae—Morindeae)

Jack: 125 (1823) conserved name; Good: 38 (1926b); Denys: 445 (1981); Verdcourt: 43 (1989); White *et al.*: 478 (2001); Coates Palgrave: 1129 (2002).

Shrubs or rarely small trees, rarely foetid, glabrous to hairy or strigose. **Leaves** opposite, mostly acuminate, thin to coriaceous, petiolate, usually with many arching lateral nerves and close venation; stipules interpetiolar, usually broadly triangular or lanceolate, not divided, persistent or deciduous. **Flowers** bisexual or sometimes unisexual, sometimes

heterostylous, mostly small, mostly in sessile axillary fascicles or glomerules or less often in pedunculate, simple or branched inflorescences; pedicels mostly absent; bracts present, usually small. **Calyx**: tube subglobose, ovoid, oblong or urceolate; limb 3–6-toothed or lobed, persistent. **Corolla** often white or pink, salver-shaped or somewhat funnel-shaped; tube densely hairy at throat; lobes 4–6, spreading or erect. **Stamens** 4–6, arising in throat of corolla; filaments very short; anthers dorsifixed near their base, included or shortly exserted. **Disc** swollen and fleshy. **Ovary** 4–12-locular; ovules solitary in each locule, erect from base, bent, anatropous; style short or elongate, glabrous or hairy, shortly 4–10-lobed at apex, lobes linear or obtuse. **Fruits** succulent, very often blue but sometimes pink, purple, white or black, with 4–12 pyrenes; pyrenes cartilaginous or bony, segment-shaped or pyriform, 3-angled with flat sides, dorsal curved face often grooved, keeled or winged, 1-seeded. **Seeds** narrowly oblong, curved, with membranous testa and fleshy albumen.

Species ± 170, predominantly in eastern tropical Asia, ± 20 species in trop. Africa and 1 in the W. Indies; sthn trop. Afr. 3, Angola (Cabinda), Zambia, Zimbabwe, Malawi, Mozambique.

Lelya Bremek.

(Rubioideae—Hedyotideae)

Bremekamp: 181 (1952b); Verdcourt: 118 (1989).

Prostrate perennial herbs. **Leaves** paired, small, shortly petiolate; stipules in lower part of stem with sheath produced into an undivided triangular lobe, in upper part deeply bifid into narrowly triangular fimbriae or less often with 3 fimbriae. **Flowers** small, bisexual, dimorphic, in terminal triads or sometimes solitary. **Calyx**: tube ovoid or ellipsoid; lobes 4, equal, oblong-elliptic or oblong-spathulate, rather thick, exceeding tube, joined at base to form a free tube. **Corolla**: tube shortly cylindric or narrowly funnel-shaped, sparsely pilose inside; lobes 4, elliptic-oblong to oblong-lanceolate. **Stamens** completely exserted in short-styled forms. **Ovary** 2-locular, with peltate placentas and 8 to fairly many ovules; style stoutly filiform, minutely bifid at apex, stigma-lobes short, subglobose or ellipsoid. **Fruit** capsular with bony walls, ellipsoid, produced into a solid beak; at length apically loculicidally dehiscent. **Seeds** few per locule, blackish, angular, pitted.

Monotypic genus: *Lelya prostrata* (R.D.Good) W.H.Lewis var. *prostrata*, and var. *angustifolia* (Bremek.) W.H.Lewis in widely separated areas of trop. Africa; sthn trop. Afr.: Angola, Zambia, Malawi. Scarcely separable from *Oldenlandia*, but apart from the bony fruits the pollen differs from all known species of that genus.

Leptactina Hook.f.

(Cinchonoideae—Pavetteae)

Hooker: 73 (1871); Good: 9 (1926b) as *Leptactinia*; Verdcourt: 491 (1979a); Robbrecht: 106 (1984); Bridson & Verdcourt: 688 (1988); Bridson: 220, 227 (1998); Robbrecht & De Block: 125 (1999); White *et al.*: 478 (2001); Coates Palgrave: 1040 (2002).

Species 25, trop. Africa, sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Macrosphyra Hook.f.

(Cinchonoideae—Gardenieae—Gardeniinae)

Hooker: 86 (1873a); Hiern: 463 (1898); Bridson & Verdcourt: 491 (1988).

Climbing or small erect shrubs, ± hairy. **Leaves** opposite, petiolate, mostly clustered at apices of shoots; stipules rather large, interpetiolar, ovate-lanceolate, thickly scarious, striate, imbricate with leaves at ends of shoots, at length deciduous. **Flowers** bisexual, scented, 5- or 6-merous, shortly pedicellate, several to many in terminal sessile clusters. **Calyx**: tube ellipsoid or obconic; tubular part of limb short; lobes subulate or linear-lanceolate, erect, persistent. **Corolla** white, cream, yellow, pink or red, ± salver-shaped, with a narrow tube, or funnel-shaped, glabrescent to pubescent outside, glabrous inside save at base which is densely hairy, or glabrous at base with rest of tube pubescent; lobes elliptic to rounded, shortly clawed, spreading, contorted. **Stamens**: anthers just exserted between corolla lobes or included; pollen in tetrads. **Ovary** 1-locular; ovules many on 2(–?4) parietal placentas; style long-exserted or included, thick; stigma large, globose, grooved. **Fruit** subglobose, many-seeded.

Species 3, trop. Africa; sthn trop. Afr. 1: *Macrosphyra brachystylis* Hiern, Angola.

Manostachya Bremek.

(Rubioideae—Hedyotideae)

Bremekamp: 145 (1952b); Verdcourt: 322 (1980c); Martins: 1 (1981); Verdcourt: 113 (1989).

Woody-based herbs. **Leaves** sessile, linear or subulate, upper ones gradually passing into bracts; stipular sheath truncate, sometimes shortly sparsely ciliate. **Flowers** sessile or shortly pedicellate, 4-merous, heterostylous, solitary or in axillary cymes arranged at many well-separated upper nodes in very open, elongate, spike-like inflorescences, or each apparent cyme actually an inflorescence terminating a brachyblast; bracteoles present. **Calyx**: tube ovoid; limb tube not developed; teeth narrowly triangular. **Corolla**: tube short, cylindric or funnel-shaped, lobes ± as long or slightly longer. **Anthers** included in long-styled flowers. **Ovary** 2-locular; placentas peltate, attached to middle of septum; ovules several, immersed in placenta. **Style** glabrous, exserted in long-styled flowers, included in short-styled flowers; stigmatic lobes 2, ovoid or filiform. **Fruit** a subglobose capsule dehiscing loculicidally. **Seeds** few, brown, oblong, dorsiventrally compressed, not becoming glutinous when wet; testa cells with thick cell walls and large perforations forming a reticulate network in the lumen.

Species 3, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Malawi.

Massularia (K.Schum.) Hoyle

(Cinchonoideae—Gardenieae—Gardeniinae)

Hoyle: 110 (1937); Hallé: 177 (1970).

Randia L., in part; Gossweiler & Mendonça: 56 (1939).

Shrubs with erect stem up to 100 mm in diameter and plagiotropic branches. **Leaves** opposite, at least shortly petiolate, narrowly elliptic to broadly ovate; branches markedly heterophyllous with one leaf of a pair up to 5 times longer or more than the other; domatia absent; stipules triangular, mucronate, glabrous outside, hairy on inner surface. **Inflorescences** cymose, few- to many-flowered, terminal to lateral. **Flowers** bisexual, articulated in upper half of a short pedicel; buds

subulate. **Calyx** long-tubular, shortly dentate at top. **Corolla** glabrous; tube exeeeding calyx tube; lobes 5, very narrowly triangular, spreading. **Stamens** 5; anthers very narrowly oblong, sessile, ± medifixed with apices at level of corolla mouth; pollen in irregular tetrads cohering in rhombic clusters. **Ovary** 2-locular; placentas ellipsoid, multi-ovulate; style glabrous, exserted, ending in 2 swollen, narrowly triangular stigmatic lobes. **Fruit** obovoid to subglobular with 10–20 faint longitudinal grooves; mesocarp thick, fleshy. **Seeds** flattened obovoid, contained inside fleshy placental tissue; embryo straight; cotyledons stipulate.

Monotypic genus: *Massularia acuminata* (G.Don) Bullock ex Hoyle, trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Mitracarpus Zucc. ex Schult. & Schult.f.

(Rubioideae—Spermacoceae)

Schultes & Schultes: 210 (1827); Verdcourt: 375 (1976); Verdcourt: 188 (1989); Bridson: 220 (1998).

Erect or prostrate annual or perennial herbs with 4-angled stems. **Leaves** opposite; blades linear-lanceolate to ovate or broadly elliptic; stipules connate with petioles to form a fimbriated sheath. **Flowers** not heterostylous or only slightly so, in dense, spherical, sessile, terminal or axillary heads. **Calyx**: tube obconic, obovoid or subglobose; teeth 4–5, 2 often longer, sometimes with minute supplementary ones between. **Corolla** salver-shaped or funnel-shaped; tube often with an internal ring of hairs; lobes 4; throat glabrous or hairy. **Stamens** arising in throat; anthers included or exserted. **Disc** fleshy. **Ovary** 2(3)-locular; ovules solitary in each locule, attached by the middle to septum; style short or long, divided into 2 short, linear branches. **Fruit** a thin circumscissile capsule, the upper part splitting off together with calyx lobes, septum persistent. **Seeds** oblong or globose, ventral face divided into 4 distinct areas; endosperm fleshy.

Species ± 30–40, mostly confined to tropical America, but 1, possibly introduced, species now common throughout trop. Africa and other parts of the Old World: *Mitracarpus villosus* (Sw.) DC.; in sthn trop. Afr. recorded from Angola, Zambia, Malawi.

Mitrasacmopsis Jovet

(Rubioideae—Hedyotideae)

Jovet: 589 (1935); Verdcourt: 103 (1989); Bridson: 218 (1998).

Diotocranus Bremek.; White: 406 (1962).

Annual herb with short, erect, branched stems. **Leaves** paired, narrowly (rarely broadly) elliptic or elliptic-lanceolate; stipules with 2–4 fimbriae from a short base. **Flowers** small, not dimorphic, in small, usually few-flowered terminal dichasial inflorescences. **Calyx**: tube ovoid; lobes 4, triangular-lanceolate. **Corolla**: tube very short; lobes ovate, throat hairy. **Ovary** 2-locular, each locule with few ovules; style not exserted; stigma bifid, lobes linear. **Fruit** a capsule of very characteristic shape, both loculicidal and septicidal, cordate and bilobed at base, with fertile part produced into a very distinct compressed obtuse central beak. **Seeds** few, compressed-subglobose, bluntly angular, distinctly reticulately pitted.

Monotypic genus: *Mitrasacmopsis quadrivalvis* Jovet, trop. Africa and Madagascar; sthn trop. Afr.: Angola, Zambia.

Mitriostigma Hochst.

(Cinchonoideae—Gardenieae—Gardeniinae)

Bridson: 127 (1979a); Bridson & Verdcourt: 539 (1988); Wells & Condy: 108 (1997); Bridson: 226 (1998); Coates Palgrave: 1048 (2002).

Sthn trop. Afr. 1: *Mitriostigma axillare* Hochst., Mozambique, and sthn Afr.

Morelia A.Rich. ex DC.

(Cinchonoideae—Gardenieae)

Candolle: 617 (1830); Hepper & Keay: 113 (1963); Hallé: 173 (1970).

Evergreen, glabrous shrubs or trees. **Leaves** petiolate, oblong-elliptic, rather abruptly and obtusely acuminate, with many domatia along midrib and in axils of secondary veins. **Inflorescences** many-flowered corymbiform cymes; bracts small, ciliate. **Calyx** deeply cupular, shortly 5-toothed, usually shortly ciliate, rarely pubescent. **Corolla** white, fragrant; tube densely hairy in upper part and mouth; lobes 5, oblong, obtuse-acute, ± as long as tube, reflexed, overlapping to the left in bud. **Stamens** exserted; anthers linear, somewhat sagittate, subbasifixed on short filaments. **Ovary** 4-locular; placentas peltate, each with 2–4 ovules; style ± as long as corolla tube, with exserted, fusiform, reddish pollen presenter. **Fruit** globose, crowned by short calyx. **Seeds** hemispherical with inner face ± concave.

Monotypic genus: *Morelia senegalensis* A.Rich., trop. Africa; sthn trop. Afr.: Angola.

Morinda L.

(Rubioideae—Morindeae)

Linnaeus: 176 (1753); Hepper & Keay: 188 (1963); Verdcourt: 145 (1976); Verdcourt: 45 (1989); Bridson: 220, 223 (1998); White *et al.*: 479 (2001).

Appunettia R.D.Good: 30 (1926b); White: 400 (1962) as synonym.

Trees, shrubs or less often lianes, with mostly glabrous, less often hairy or tomentose stems. **Leaves** opposite or rarely in whorls of 3, sometimes only 1 at flowering nodes; stipules leafy, undivided, free or forming a sheath with the petioles. **Flowers** generally heterostylous, bisexual or rarely unisexual, in tight capitula, flowers usually joined, at least by bases of calyces, capitula sometimes bearing single, large, coloured bracts or occasionally many smaller bracts; capitula 1–several at nodes, frequently arranged in umbels, pedunculate or rarely sessile. **Calyx**: tube urceolate or hemispherical, limb short, truncate or obscurely to distinctly toothed, persistent. **Corolla** coriaceous, funnel-shaped or salver-shaped; lobes (4)5(–7), valvate; throat glabrous or pilose. **Stamens** (4)5(7), arising in throat; filaments short; anthers and style included or exserted. **Disc** swollen or annular. **Ovary** 2–4-locular, sometimes imperfectly so; style with 2 short to long linear branches; ovules solitary in locules, attached to septum below middle or near base, ascending, anatropous or amphitropous. **Fruit** syncarpous (very rarely scarcely so), succulent, containing several pyrenes; pyrenes cartilaginous or bony, 1-seeded or joined into a 2–4-locular woody structure. **Seeds** obovoid or reniform, with a membranous testa and fleshy endosperm.

Species ± 80, throughout the tropics; sthn trop. Afr. 4, Angola, Zambia, Malawi.

Multidentia Gilli

(Ixoroideae—Vanguerieae)

Gilli: 77 (1973); Bridson: 641 (1987b); Bridson: 841 (1991); Bridson: 309 (1998); Coates Palgrave: 1103 (2002); Lantz *et al.*: 181 (2002); Mapaura & Timberlake: 168 (2002).

Shrubs or small trees to 12 m tall, or sometimes pyrophytic subshrubs, mostly glabrous, unarmed; stems often lenticellate. **Leaves** mostly restricted to new growth, paired or rarely ternate, petiolate; blades chartaceous to coriaceous, typically glaucous beneath, with a conspicuous network of finely, or less often, coarsely reticulate tertiary nerves; domatia present as tufts of hair, or absent; stipules sheathing at base, pubescent within, provided with a linear somewhat keeled lobe. **Flowers** (4)5(6)-merous, usually medium-sized, borne in pedunculate cymes, usually at nodes from which leaves have fallen, except in pyrophytic species; bracteoles linear to lanceolate, small. **Calyx** chartaceous or coriaceous; limb cupular, truncate, repand, dentate, or cupular below and lobed above. **Corolla** normal or coriaceous and drying wrinkled; tube cylindric, ± equal to lobes or occasionally much longer, glabrous outside with a ring of deflexed hairs inside and usually rather sparsely pubescent at throat; lobes reflexed, rounded or obtuse, thickened towards apex. **Stamens** set at throat; anthers partly or fully exserted, oblong-ovate or oblong with dark-coloured connective tissue on dorsal face except for margin, often apiculate. **Ovary** 2-locular; style slightly longer, or less often up to twice as long as corolla tube, slender; pollen presenter ± as broad as long or less, often elongate, ribbed, hollow to mid-point, apex cleft to ± mid-point when mature; disc glabrous. **Fruit** a 2-seeded drupe, large, subglobose, laterally compressed, often somewhat didymous, often lenticellate, crowned by a persistent calyx limb. **Pyrenes** thickly woody, broadly ellipsoid, sometimes curved, truncate at point of attachment, with a line of dehiscence extending from point of attachment to apex, then arching on either side back towards point of attachment but stopping short of it, very strongly rugulose, (except in *Multidentia pobeguinii*); seeds with endosperm entire; testa finely reticulate; embryo slightly curved; radicle erect; cotyledons ± $^1/_3$ as long as embryo, set perpendicular to ventral face of seed.

Species 11 (2 poorly known), trop. Africa; sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Mussaenda L.

(Cinchonoideae—Mussaendeae)

Linnaeus: 177 (1753); Hiern: 452 (1898); Wernham: 299 (1916); Good: 3 (1926b); Hepper & Keay: 164 (1963); Bridson & Verdcourt: 460 (1988); Puff *et al.*: 35 (1993); Bridson: 213, 222, 223, 226 (1998); White *et al.*: 479 (2001); Coates Palgrave: 1039 (2002).

Shrubs, scandent shrubs or lianas. **Leaves** petiolate; blades usually elliptic with an acute or acuminate apex, pubescent or less often glabrous; stipules entire to completely bilobed, persistent or caducous. **Flowers** usually yellow to red or sometimes white, occasionally sweet-scented, isostylous or heterostylous, borne in terminal panicles. **Calyx**: tube oblong, turbinate or ovoid; lobes 5, usually subulate, linear, slightly spathulate or sometimes short and dentate or rounded, persistent or caducous; frequently several lobes on each inflorescence develop into a stalked white, creamy yellow or sometimes red dilated lamina; colleters usually present between calyx lobes. **Corolla**: tube cylindric, narrowly funnel-shaped or abruptly widened to accommodate the anthers, with flattened or fine hairs at throat and between anthers; limb 5-lobed, lobes reduplicate in bud, spreading at maturity, often with centre portion connate, with short hairs and often a star of longer, coloured hairs above. **Stamens**: anthers 5, with tips just level with the throat or inserted up to halfway down the tube, linear, connective very shortly acuminate at apex, attached by very short filaments near base. **Ovary** 2(3 or 4)-locular; ovules numerous, inserted on fleshy placentas; style slender, sometimes divided into 2 arms; stigma included or occasionally exserted, lobes 2, ± oblong to fusiform. **Fruit** fleshy, indehiscent, globose, ellipsoid or oblong, sometimes crowned by persistent calyx lobes. **Seeds** many, pale brown to blackish, small, usually ± flattened, reticulate.

Species 100, Old World tropics; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi.

Nauclea L.

(Cinchonoideae—Cinchoneae)

Linnaeus: 243 (1762); White: 413 (1962); Hepper & Keay: 163 (1963); Ridsdale & Bakhuizen van den Brink: 547 (1975); Bridson & Verdcourt: 441 (1988).

Medium-sized to large trees; terminal vegetative buds strongly flattened. **Leaves** opposite, petiolate, axils of nerves with or without domatia; stipules ovate, obovate or elliptic, flattened, adpressed, deciduous or ± persistent. **Inflorescences** terminal or terminal and lateral with unbranched axes; nodes with reduced leaves and stipules surrounding young inflorescence not modified into bracts; true peduncle glabrous or pubescent, elongating. **Flowers** 4- or 5-merous. **Calyx** glabrous or pubescent inside; tube developed or not; lobes triangular or oblong, obtuse, with or without persistent appendages. **Corolla**: tube funnel-shaped; lobes oblong, imbricate. **Stamens** arising in throat, exserted; filaments short, glabrous; anthers basifixed, introrse. **Ovaries** entirely fused to each other, 2-locular; placentas attached to upper third of septum, Y-shaped with 2 short ascending arms and a long basal one; ovules many in each locule, mostly pendulous, some erect or horizontal but these mostly aborting; style exserted; stigma spindle-shaped. **Fruits** indehiscent, connate into a fleshy syncarp. **Seeds** ovoid or ellipsoid, sometimes compressed, not winged.

Species 10, Old World tropics; sthn trop. Afr. 3, Angola, Zambia.

Neopentanisia Verdc.

(Rubioideae—Knoxieae)

Verdcourt: 113 (1953e); Puff & Robbrecht: 513, 534, 548 (1989).

Small, erect annual herbs; stems slender. **Leaves** opposite, glabrous, subsessile; stipular sheath divided into subulate lobes. **Flowers** bisexual, dimorphic. **Inflorescence** a terminal spike or head. **Calyx**: lobes ± 5, 1 or 2 of them small and leaf-like, the others minute. **Corolla**: tube filiform, slender, densely villous around the mouth; lobes 5, oblong-ovate with valvate aestivation. **Stamens** in long-styled flowers included, in short-styled ones exserted. **Ovary** bilocular; ovules solitary, pendulous. **Fruit** 2-lobed, each lobe subglobose, strongly papillate.

Species 2, endemic to DRC and Angola.

Nichallea Bridson

(Cinchonoideae—Pavetteae)

Bridson: 288 (1978b).

Shrubs; branches at first pubescent or glabrous, later covered with reddish brown bark. **Leaves** opposite, petiolate, ± elliptic; domatia small or absent; stipules short, oblong or broadly triangular, apex aristate. **Flowers** bisexual, fragrant, (4)5-merous. **Inflorescences** terminal or pseudoterminal, asymmetric; subtending leaves very unequal, sometimes reduced to a single leaf; bracteoles inconspicuous. **Calyx**: tube obconic, tubular part of limb short; lobes ovate to triangular. **Corolla** white, turning black when drying, trumpet-shaped; tube cylindric, slender; lobes ± half as long as tube, with dextrorse aestivation. **Stamens** exserted; anthers linear, ± basifixed on short filaments in mouth of corolla, connnective slightly exceeding anther. **Disc** annular, glabrous. **Ovary** 2-locular; placenta short, fleshy; ovule 1 per locule; style filiform, sparsely pubescent; stigma narrowly clavate, fully exserted, usually longer than corolla lobes. **Fruit** baccate, globose, containing 1, 1-seeded pyrene. **Seed** ± globose, flattened above, longitudinally striate.

Monotypic genus: *Nichallea soyauxii* (Hiern) Bridson, trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Oldenlandia L.

(Rubioideae—Hedyotideae)

Bremekamp: 183 (1952b); Verdcourt: 268 (1976); Verdcourt: 120 (1989); Bridson: 219 (1998); Bingham & Smith: 143 (2002); Izidine & Bandeira: 52 (2002).

Sthn trop. Afr. 33, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Otiophora Zucc.

(Rubioideae—Hedyotideae)

Good: 40 (1926b); Verdcourt: 62 (1953c); Verdcourt: 25 (1973c); Verdcourt: 315 (1976); Puff: 119 (1981); Puff: 142 (1989); Bridson: 219 (1998).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Otomeria Benth.

(Rubioideae—Hedyotideae)

Bentham: 405 (1849); Good: 3 (1926b); Verdcourt: 5 (1953a); White: 413 (1962); Verdcourt: 213 (1976); Verdcourt: 78 (1989); Bridson: 219 (1998).

Tapinopentas Bremek.; White: 421 (1962).

Annual or perennial, erect, subprostrate or twining herbs with mostly hairy stems. **Leaves** paired; stipules with base divided into several narrow segments. **Flowers** bisexual, small and white or rather large and coloured, monomorphic or dimorphic, in cymose heads, which in fruit develop into a long simple spike with fruits geminately arranged and a solitary remotely placed flower in axil at base of spike. **Calyx**: tube ovoid or elongate-oblong; lobes 5, unequal: 1–3 foliaceous and larger than the rest, alternating with small colleters. **Corolla**: tube long and narrow, with a markedly ovoid-oblong apical dilation in long-styled forms; throat densely hairy; lobes in small-flowered species elliptic, but in large-flowered species broader, ovate to orbicular, narrowing to base where lobes are often connate for a short distance. **Stamens** completely exserted in short-styled forms. **Style** exserted in long-styled forms, stigma bifid with filiform lobes; anthers completely included in apical dilation of corolla tube. **Capsule** oblong, compressed, ribbed, opening by apical valves and also frequently splitting longitudinally. **Seed**s small, reticulate.

Species 8, widely distributed in trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Oxyanthus DC.

(Cinchonoideae—Gardenieae—Gardeniinae)

Good: 16 (1926b); Bridson: 113 (1979a); Bridson & Verdcourt: 526 (1988); Robbrecht *et al.*: 17 (1996); Bridson: 226 (1998); Sonké: 1 (1999); White *et al.*: 479 (2001); Coates Palgrave: 1060 (2002); Msekandiana & Mlangeni: 42 (2002).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pachystigma Hochst.

(Ixoroideae—Vanguerieae)

Verdcourt: 764 (1991); Bridson: 241 (1998); Coates Palgrave: 1104 (2002); Lantz *et al.*: 173 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Paederia L.

(Rubioideae—Paederieae)

Puff: 63 (1989); Puff: 1 (1991); Bridson: 222 (1998).

Sthn trop. Afr. 1: *Paederia bojeriana* (A.Rich.) Drake, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Paraknoxia Bremek.

(Rubioideae—Knoxieae)

Bremekamp: 77 (1952a); Puff & Robbrecht: 550 (1989); Verdcourt: 57 (1989); Bridson: 219 (1998).

Annual herbs. **Leaves** paired, shortly petiolate; stipules small, with several deltoid segments from a short base. **Flowers** bisexual, small, dimorphic, some flowers with anthers included and style exserted and others completely vice versa, in small sessile terminal heads. **Calyx**: tube short; lobes small, 3 or 4, sometimes 1 enlarged and rest minute, or all minute. **Corolla**: tube narrowly funnel-shaped; lobes 3 or 4, oblong; throat hairy. **Ovary** 2-locular; ovules solitary in each locule, pendulous; style filiform; stigma bifid, lobes filiform. **Fruit** ovoid, indehiscent, but longitudinally grooved and where fruit breaks off a little cup is left being the persistent woody flanged pedicel; between this flange and base of fruit masses of raphides present. **Seeds** narrowly ellipsoid or ovate in outline, strongly compressed.

Monotypic genus: *Paraknoxia parviflora* (Stapf ex Verdc.) Verdc. ex Bremek., E and C Africa; sthn trop. Afr.: Angola, Zimbabwe, Malawi; close to *Pentanisia*.

Parapentas Bremek.

(Rubioideae—Hedyotideae)

Bremekamp: 50 (1952b); Verdcourt: 53 (1953c); Verdcourt: 224 (1976); Robbrecht: 174, 186 (1981a); Robbrecht: 718 (1981c).

Procumbent perennial forest floor herbs. **Leaves** paired, petiolate, well-developed and with lateral venation clearly evident; stipule sheath divided into several subulate, colleter-tipped lobes. **Flowers** bisexual, white or lilac, isostylous or heterostylous, terminal or pseudo-axillary, sessile, usually solitary or sometimes paired. **Calyx**: tube campanulate; lobes 5, ± equal, linear or linear-oblong. **Corolla**: tube narrowly tubular, glabrous or sparsely to densely pilose within throat; lobes 5, elliptic, minutely papillate inside. **Stamens** and **style** exserted in isostylous species, in normally heterostylous species stamens usually well-exserted. **Ovary** 2-locular with peltate placentas and numerous ovules. **Fruit** an obconic or globose capsule, sometimes compressed beneath, not beaked, dividing into 4 valves. **Seeds** numerous, brown, angular, pitted.

Species ± 5, trop. Africa; sthn trop. Afr. 1: *Parapentas setigera* (Hiern) Verdc., Angola (Cabinda).

Pauridiantha Hook.f.

(Cinchonoideae—Pauridiantheae)

Hooker: 69 (1873a); White: 414 (1962); Verdcourt: 152 (1976); Verdcourt: 51(1989); Bridson: 224 (1998); White *et al.*: 482 (2001); Coates Palgrave: 1040 (2002).

Urophyllum Wall. in part; Burtt Davy *et al.*: 90 (1958); Martins: 62 (1994).

Shrubs, small trees or subscandent woody plants. **Leaves** opposite or ternate, shortly petiolate; petioles compressed, channelled; blades acuminate or caudate, usually with acarodomatia; midnerve channelled; stipules interpetiolar, triangular or ovate, entire, acute. **Flowers** bisexual, mostly heterostylous, usually 5-merous, in axillary or terminal, sessile or pedunculate, trichotomously corymbose or subumbellate inflorescences, sometimes reduced to a few or even single flowers; peduncle with 1 or 2(4)-parted involucels situated at apex or middle; other bracts small or absent. **Calyx**: tube short, denticulate, dentate or lobed. **Corolla** salver-shaped, white, greenish, violet or lavender; tube short, funnel-shaped or cylindric, upper half densely hairy inside; lobes glabrous inside. **Stamens** with glabrous filaments and dorsifixed anthers, exserted in short-styled flowers. **Disc** cushion-shaped, papillate or shortly hairy. **Ovary** 2- or 3-locular at base, 4–6-locular at apex, with 2 or 3, sometimes lobed placentas affixed at middle of true septum, false septa incised and broadly cordate; ovules many; style glabrous, puberulous or hairy, included or exserted; stigmas 2, globose, mitriform or subcapitate, apex shortly 2-lobed, lobes cohering or rarely free and linear or lanceolate. **Fruit** a globose, yellow or red berry, 2-locular at base, 4-locular at top. **Seeds** many, yellow or yellow-brown, rarely red, ovoid; testa alveolate and sometimes irregularly ribbed; endosperm oily.

Species ± 20–25, confined to trop. Africa and Madagascar; sthn trop. Afr. 4 or 5, Angola (Cabinda), Zambia, Zimbabwe, Malawi, Mozambique.

Pausinystalia Pierre ex Beille

(Cinchonoideae—Coptosapelteae)

Beille: 130 (1906); Good: 1 (1926b); Hallé: 66 (1966); Robbrecht: 175 (1993); Stoffelen & Robbrecht: 307 (1996).

Tall trees with decussate branching. **Leaves** petiolate, obovate or elliptic, cuneate or rounded, acuminate, glabrous, with 8–11 pairs of prominent secondary nerves on each side of midrib and hairy to glabrous domatia; stipules interpetiolar, caducous, in vernation interlocking with each other or enclosing one another. **Inflorescence** thyrsic, axillary; stipules at base caducous. **Flowers** (4)5(6)-merous. **Calyx**: tube short, inside densely hairy; lobes triangular to rounded, sometimes with 1 or 2 colleters in sinuses. **Corolla** glabrous outside; tube with a short, basal, cylindric portion and a campanulate-inflated upper portion longer than basal portion, hairy inside; lobes with valvate aestivation, cowl-shaped, hairy inside, each with a very long, filiform apical appendage. **Stamens**: anthers included, sessile, sagittate, medifixed, with acuminate apex, dehiscing longitudinally, arising ± in middle of campanulate portion of tube. **Disc** indistinct. **Ovary** 2-locular; placenta pendulous, arising at top of septum, covered with many upwardly imbricate ovules; style shorter than corolla tube; stigma 2-lobed. **Fruit** an ellipsoid septicidal capsule with tips of valves slightly loculicidal. **Seeds** winged, very narrowly elliptic in outline, with apical portion narrowly triangular, and basal part deeply divided into 2 long very narrowly triangular wings; central endosperm-bearing portion ellipsoid, $^1/_3$–$^1/_4$ as long as entire seed; embryo surrounded by endosperm.

Species 5, tropical W Africa; sthn trop. Afr. 1: *Pausinystalia macroceras* (K.Schum.) Pierre, Angola.

Pavetta L.

(Cinchonoideae—Pavetteae)

Good: 24 (1926b); Bridson & Verdcourt: 619 (1988); Bridson: 221, 223, 227 (1998); Bridson: 567 (2001); White *et al.*: 484 (2001); Bingham & Smith: 143 (2002); Coates Palgrave: 1109 (2002); Mapaura & Timberlake: 168 (2002).

Sthn trop. Afr. ± 55, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pentaloncha Hook.f.

(Position unclear)

Hooker: 73 (1873a); Hiern: 79 (1877); Oliver: t. 2326 (1894); Good: 8 (1926b); Hallé: 226 (1966).

Decumbent herbs rooting at lower nodes; young parts minutely hairy. **Leaves** large, but leaves of a pair usually different in size, sometimes markedly so, petiolate, oblanceolate; base long-cuneate; apex subacute; glabrous above; veins pubescent on lower surface, 8–14(17) secondary veins on each side of midrib; stipules interpetiolar, very narrowly lanceolate, very long-acute, entire or sometimes bifid, glabrous. **Inflorescences** dense, pedunculate, axillary, 5–20-flowered cymes. **Flowers** small, bisexual, pedicelled, usually 5-merous. **Calyx**: tube campanulate in flower, globose in fruit; lobes subequal, pedicelled and spatulate-lanceolate, leaf-like, ± as long as corolla, persistent. **Corolla** tubular, slightly funnel-shaped, densely pubescent inside except towards base, densely hirsute in throat, puberulous outside; lobes ovate-triangular. **Stamens** arising in middle of corolla tube (in longistylous form), or shortly below the throat (in brevistylous form); anthers

subsessile, linear-oblong, slightly lunate, apieulate; pollen simple. **Disc** annular, yellow. **Ovary** 2(3)-locular, puberulous; style slender, glabrous; stigma narrowly 2-lobed; ovules many, on peltate, axile placentas. **Fruit** spherical, indehiscent, crowned by the slightly accrescent calyx. **Seeds** spherical, reddish brown, pitted, sitting in slight depressions in peltate placentas.

Species 2, tropical W Africa; sthn trop. Afr. 1: *Pentaloncha rubriflora* R.D.Good, Angola (Cabinda).

Pentanisia Harv.

(Rubioideae—Knoxieae)

Verdcourt: 233 (1952); Verdcourt: 167 (1976); Puff & Robbrecht: 550 (1989); Verdcourt: 57 (1989); Bridson: 221 (1998); Bingham & Smith: 144 (2002).

Chlorochorion Puff & Robbrecht: 547 (1989). *Pentacarpaea* Hiern: 439 (1898).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pentas Benth.

(Rubioideae—Hedyotideae)

Verdcourt: 237 (1953d); Verdcourt: 66 (1989); Bridson: 219, 220 (1998); White *et al.*: 487 (2001).

Sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pentodon Hochst.

(Rubioideae—Hedyotideae)

Verdcourt: 263 (1976); Verdcourt: 116 (1989); Bridson: 218 (1998).

Sthn trop. Afr. 1: *Pentodon pentandrus* (Schumach. & Thonn.) Vatke, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Phellocalyx Bridson

(Cinchonoideae—Gardenieae)

Bridson *et al.*: 315 (1980); Bridson & Verdcourt: 519 (1988); Bridson: 227 (1998).

Shrubs or small trees; branches pubescent when young. **Leaves** opposite, petiolate, membranous, restricted to new growth at apex of stems; domatia present as white hairy tufts in axils of nerves; stipules interpetiolar, ovate-triangular, with colleters and silky hairs inside. **Flowers** bisexual, precocious, solitary, terminal on short lateral branches (but may be exceeded by the development of an axillary branch), sessile, large. **Calyx** 6–8-ribbed, covered with very short fleshy hairs when young, which soon erode to reveal a rather flaky corky underlayer; tube campanulate; limb entire in bud, acuminate, rupturing into 2 or 3 lobes at anthesis, densely covered with silky hairs with large interspersed colleters inside. **Corolla**: tube short in proportion to the lobes, cylindric to funnel-shaped; lobes 8–11, narrowly oblong, spreading, overlapping to the right in bud (as seen from outside). **Stamens**: anthers 8–11, sessile, attached near base, inserted at throat, exserted, ± two-thirds the length of the corolla lobes, linear, shortly acuminate; pollen grains simple. **Disc** annular. **Ovary** 4-locular (or ? incompletely so); septa thinly membranous, adhering to the placentas; placentas 4, elongate, fleshy, attached at apex to base of style; ovules many, impressed on placentas; style slightly swollen, glabrous; stigmatic club exserted, cylindric, 2-winged, bifid at apex with each lobe emarginate. **Fruit** large, globular, smooth, 1-locular; ealyx limb caducous; pericarp thick. **Seeds** many, embedded in pulpy placental tissue, sublenticular; testa very thin, finely rugulose; endosperm entire, horny; embryo straight.

Monotypic genus: *Phellocalyx vollesenii* Bridson, tropical E Africa; sthn trop. Afr.: Malawi, Mozambique.

Phylohydrax Puff

(Rubioideae—Spermacoceae)

Verdcourt: 162 (1989); Bridson: 220 (1998).

Sthn trop. Afr. 1: *Phylohydrax carnosa* (Hochst.) Puff, Mozambique, and sthn Afr.

Plectroniella Robyns

(Ixoroideae—Vanguerieae)

Bridson: 337 (1998); Lantz *et al.*: 173 (2002).

Sthn trop. Afr. 1: *Plectroniella armata* (K.Schum.) Robyns, Mozambique, and sthn Afr..

Polysphaeria Hook.f.

(Ixoroideae—Hypobathreae)

Hooker: 108 (1873a); Good: 21 (1926b); Verdcourt: 97 (1980a); Bridson & Verdcourt: 569 (1988); Bridson: 225 (1998); White *et al.*: 487 (2001); Coates Palgrave: 1073 (2002).

Glabrous or hairy shrubs or small trees with supra-axillary branches. **Leaves** usually thinly coriaceous with a characteristic divaricate venation, usually oblong-elliptic to lanceolate, less often more rounded; stipules triangular, acuminate or aristate with raised midline. **Flowers** sessile or rarely pedicellate, usually small in sessile or pedunculate bracteate elusters; bracts and bracteoles forming a complicated pattern of primary bracts; secondary bracts often supporting triads of flowers, and bracteoles often several per flower usually joined to form a cup at base of calyx. **Calyx**: tube campanulate or turbinate; tube of limb cup- or bowl-shaped, obconic or sometimes tubular, occasionally covering corolla in bud, truncate or 4- or 5-toothed, persistent. **Corolla**: tube narrowly funnel-shaped or cylindric, densely hairy at throat; lobes 4 or 5, strictly contorted, overlapping to the left (as seen in bud), ovate to oblong, acuminate, spreading. **Stamens** 4 or 5, inserted in corolla tube, filaments very short; anthers linear, fixed at back near base, included or partly exserted, sometimes minutely apiculate. **Disc** small but evident, fleshy. **Ovary** 2-locular; ovule solitary in each locule, pendulous; style filiform, exserted, usually shortly pubescent or hairy, with filiform or rarely ± ellipsoid undivided or slightly to distinctly bifid stigma. **Fruits** pea-like with rather tough epicarp, 1- or 2-locular, 1- or 2-seeded. **Seeds** subglobose to plano-convex with striate-sulcate testa and very ruminate endosperm.

Species 20, trop. Africa, Madagascar, Comoro Islands; sthn trop. Afr. 5, Angola (Cabinda), Zambia, Malawi, Mozambique.

Pouchetia A.Rich. ex DC.

(Ixoroideae—Hypobathreae)

Candolle: 393 (1830); Hiern: 466 (1898); Hepper & Keay: 130 (1963); Hallé: 263 (1970).

Low to tall shrubs with glabrous vegetative parts. **Leaves** opposite, petiolate, narrowly oblong to elliptic, attenuate at both ends, shiny; domatia absent; stipules broadly triangular, long-acuminate. **Inflorescences** axillary, few-flowered, pedunculate, in pairs at successive nodes. **Flowers** bisexual, sessile. **Calyx** cup-shaped, glabrous, with 5 unequal subspathulate lobes. **Corolla** ± funnel-shaped, glabrous outside, with 5 ovate lobes, contorted. **Stamens** very narrowly oblong, sessile, with apices exserted. **Ovary** 2- or 3-locular, locules sometimes fusing in upper part; ovules 2–8 per locule; pollen presenter far exserted, spindle-shaped. **Fruit** baccate with juicy edible pulp. **Seeds** 1–15; testa fibrous; endosperm copious; embryo straight.

Species 6, trop. Africa; sthn trop. Afr. 2, Angola.

Pseudogardenia Keay

(Cinchonoideae—Gardenieae)

Keay: 45 (1958a); Hepper & Keay: 124 (1963); Hallé: 225 (1970).

Climbing shrubs or lianes with pubescent internodes. **Leaves** opposite, shortly petiolate, obovate, ± pubescent on lower surface; stipules intrapetiolar, narrowly triangular, acicular, pubescent, ± persistent; domatia absent. **Inflorescence**: flowers solitary, terminal on lateral branches. **Calyx** narrowly conical; lobes 5(6), ovate or elliptic, imbricate. **Corolla** narrowly funnel-shaped, conspicuous, *Rothmannia*-like, densely sericeous outside, glabrous or puberulous inside; tube up to 160 mm long; lobes 5(6), ovate or lanceolate. **Stamens** 5(6); anthers sessile, linear, arising in mouth of corolla tube, half-exserted, often twisted in upper part. **Ovary** 1-locular with 2 long parietal, many-ovuled placentas; style partly pubescent, with a spindle-shaped pollen presenter at level of anthers terminating in 2 small subglobose stigmatic lobes. **Fruit** baccate, subglobose, 10–12-ribbed, crowned with ± persistent calyx. **Seeds** lenticular, many amassed in placental tissue.

Monotypic genus: *Pseudogardenia kalbreyeri* (Hiern) Keay, trop. Africa; sthn trop. Afr.: Angola (Cabinda). Robbrecht & Bridson: 197 (1993) accept the name *Adenorandia* Vermoesen (1922) for this genus.

Pseudomussaenda Wernham

(Cinchonoideae—Isertieae)

Wernham: 298 (1916); Troupin & Petit: 227 (1953); Hallé: 136 (1966); Bridson & Verdcourt: 467 (1988); Puff *et al.*: 35 (1993); Verdcourt: 416 (1993); Bridson: 213, 223 (1998); Izidine & Bandeira: 59 (2002).

Erect or sometimes probably scrambling shrubs or subshrubs. **Leaves** opposite, petiolate, lanceolate to ovate; stipules triangular or bifid. **Flowers** bisexual, ± sessile, heterostylous, fairly large, in several- to many-flowered cymose terminal inflorescences; 1–several peripheral flowers often have 1 calyx lobe enlarged into a petaloid, coloured, stipitate lamina. **Calyx**: tube elongate, ± oblong; lobes 5, ± subulate. **Corolla**: tube narrowly cylindric, upper part containing anthers somewhat swollen; lobes (4)5, ovate, induplicate-valvate, usually drawn out into a filiform appendage very evident in the buds which have (4)5 apical subulate projections; throat velvety hairy. **Stamens** included in swollen part of tube. **Ovary** 2-locular, each locule with many ovules borne on the marginal portions of very narrowly oblong curved placentas which resemble lamellae; style ± $^3/_4$ as long as corolla tube in short-styled flowers; stigmas just exserted in long-styled flowers; stigma bilobed, with lobes linear or ovoid. **Fruit** dry, mostly capsular, with rather incomplete loculicidal dehiscence or sometimes not dehiscent; calyx lobes soon caducous. **Seeds** small, reticulate.

Species 5, trop. Africa; sthn trop. Afr. 3, Angola, Mozambique.

Psilanthus Hook.f.

(Ixoroideae—Coffeeae)

Hooker: 28 (1873d); Good: 28 (1926b); Hepper & Keay: 157 (1963); Leroy: 251 (1981); Bridson & Verdcourt: 723 (1988); Bridson: 215 (1998).

Shrubs or small trees. **Leaves** opposite, petiolate, papery to subcoriaceous; domatia usually present, hairy; stipules shortly sheathing, with a truncate to triangular limb usually bearing a linear to subulate lobe, often caducous. **Flowers** bisexual, (4)5-merous, terminal or axillary or both terminal and axillary, solitary or paired, sessile to shortly pedicellate; bracts and bracteoles absent or glumaceous; flower sometimes subtended by young leaves above bracteoles. **Calyx**: tube ovate to campanulate; limb subequalling the disc, 5-lobed or irregularly toothed, and margin beset with colleters. **Corolla** white; tube cylindric but widened at apex, equalling to over twice as long as lobes, glabrous or sparsely pubescent outside; lobes contorted in bud, spreading. **Stamens**: anthers set at mouth of corolla, sessile, linear, shortly apiculate at apex, scarcely hastate at base, usually attached above to well above the middle, with apical part exserted or sometimes entirely included, occasionally tending to adhere towards base. **Disc** annular. **Ovary** 2-locular; placentas small, attached to middle or somewhat above middle of septum; style cylindric, slender, glabrous, usually much shorter than corolla tube; stigma included, bifid; arms linear to narrowly oblong, sometimes not separating. **Fruit** a drupe, ellipsoid or broader than long and distinctly 2-lobed, containing 2, 1-seeded cartilaginous pyrenes; calyx lobes greatly or not at all accrescent. **Seed** oblong-ellipsoid, grooved on inner face; endosperm pale in colour, horny, asymmetrically folded from groove, embryo somewhat curved; testa thin, smooth at low magnifications.

Species ± 20, Old World, E to Australia; sthn trop. Afr. 2, Angola.

Psychotria L.

(Rubioideae—Psychotrieae)

Good: 31, 32 (1926b); Verdcourt: 26 (1976); Verdcourt: 9 (1989); Bridson: 220, 221, 222, 224 (1998); White *et al.*: 488 (2001); Bingham & Smith: 144 (2002); Coates Palgrave: 1126 (2002).

Cephaelis Sw.; White: 405 (1962). *Grumilea* Gaertn.; Hiern: 494 (1898). White: 408 (1962); *Myristiphyllum* P.Browne, in part; Hiern: 493 (1898). *Ouragoga* L.; Hiern: 498 (1898). *Uragoga* Baill.; Good: 35 (1926b); Gossweiler & Mendonça: 57 (1939); Burtt Davy *et al.*: 90 (1958).

Sthn trop. Afr. 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Psydrax Gaertn.

(Ixoroideae—Vanguerieae)

Bridson: 687 (1985); Bridson: 892 (1991); Bridson: 345 (1998); Bingham & Smith (2002); Coates Palgrave: 1096 (2002); Lantz *et al.*: 183 (2002); Mapaura & Timberlake: 168 (2002).

Mitrastigma Harv.; Phillips: 587 (1926). *Pavetta* L. in part as to *P. parviflora* Afzel.

Sthn trop. Afr. 19, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pygmaeothamnus Robyns

(Ixoroideae—Vanguerieae)

Good: 23 (1926b) as *Pygmacothamnus*; Verdcourt: 776 (1991); Bridson: 307 (1998); Lantz *et al.*: 173 (2002).

Sthn trop. Afr. 1: *Pygmaeothamnus zeyheri* (Sond.) Robyns, with 2 varieties, Angola, Zambia, Zimbabwe, and sthn Afr.

Pyrostria Comm. ex Juss.

(Ixoroideae—Vanguerieae)

Bridson: 611 (1987a); Bridson: 885 (1991); Bridson: 340 (1998); Coates Palgrave: 1102 (2002); Lantz *et al.*: 184 (2002); Mapaura & Timberlake: 169 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Richardia L.

(Rubioideae—Spermacoceae)

Verdcourt: 377 (1976); Verdcourt: 190 (1989); Bridson: 220 (1998).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rothmannia Thunb.

(Cinchonoideae—Gardenieae—Gardeniinae)

Keay: 47 (1958a); Bridson & Verdcourt: 511 (1988); Somers & Robbrecht: 295 (1991); Sonké & Simo: 219 (1996); Bridson: 227 (1998); White *et al.*: 492 (2001); Coates Palgrave: 1056 (2002).

Sthn trop. Afr. 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rubia L.

(Rubioideae—Rubieae)

Verdcourt: 380 (1976); Puff: 193 (1989); Bridson: 218, 222 (1998).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rutidea DC.

(Cinchonoideae—Pavetteae)

Candolle: 219 (1807); Bridson: 243 (1978a); Bridson & Verdcourt: 605 (1988); Bridson: 222 (1998); White *et al.*: 494 (2001); Coates Palgrave: 1124 (2002).

Scandent shrubs, often with hairy stems. **Leaves** paired, petiolate; domatia absent or present as hairy tufts in axils of lateral and sometimes tertiary nerves beneath; bacterial nodules absent; stipules with 3–15 fimbriae or with a single lobe. **Flowers** bisexual, 4- or 5(6)-merous, sessile or pedicellate in pyramidal to racemiform or hemispherical to flat-topped panicles, terminal on the main or short lateral branches, sessile to pedunculate (the presence of rudimentary leaves frequently renders this character ambiguous); bracts and bracteoles present, either conspicuous and exceeding calyx or inconspicuous. **Calyx**: tube ovoid to campanulate; limb tube usually short, slightly wider than tube, bearing 4 or 5(6) ovate, subulate, filiform to linear or triangular lobes. **Corolla** white or cream, usually small, salver-shaped; tube cylindrical to funnel-shaped, glabrous to sparsely pubescent inside; lobes 4 or 5(6), contorted in bud, spreading or reflexed. **Stamens** arising in mouth of tube, exserted, or at least partly so; filaments short; anthers attached near base or occasionally near middle, usually shortly apiculate. **Disc** fleshy, glabrous. **Ovary** 2(3)-locular (or incompletely so); ovules solitary, inserted on a small fleshy placenta ascending from base of ovary; style slender, greatly or less often scarcely exceeding corolla tube, glabrous or nearly so or less often densely pubescent just above base; stigma ± exserted, fusiform, clavate or broadly elliptic to globose, entire or rarely 2- or 3-lobed. **Fruit** 1-locular, frequently orange to red, drupaceous, spherical, somewhat fleshy with a chartaceous endocarp; calyx limb persistent or less often deciduous. **Seed** 1, globose, filling the cell, hilum basal, irregular; testa thin, reticulate; albumen horny, deeply ruminate; embryo curved.

Species 20, trop. Africa and Madagascar; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Rytigynia Blume

(Ixoroideae—Vanguerieae)

Verdcourt: 145 (1987); Verdcourt: 802 (1991); Bridson: 285 (1998); Verdcourt: 416 (1993); White *et al.*: 496 (2001); Bingham & Smith: 144 (2002); Coates Palgrave: 1081 (2002); Lantz *et al.*: 182 (2002); Mapaura & Timberlake: 169 (2002); Msekandiana & Mlangeni: 38 (2002).

Plectronia in part.

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sabicea Aubl.

(Cinchonoideae—Isertieae)

Aublet: 192 (1775); Hiern: 454 (1898); Gossweiler & Mendonça: 83 (1939); Hepper: 289 (1958); White: 420 (1962); Bridson & Verdcourt: 469 (1988); Bridson: 222, 223 (1998).

Lianes, straggling shrubs or sometimes scarcely woody climbers, usually ± hairy. **Leaves** opposite, petiolate; stipules entire or emarginate, often comparatively large, mostly with conspicuous colleters within. **Flowers** sometimes showing limited heterostyly, small or medium-sized, in sessile or pedunculate, several- to many-flowered paniculate or capitate axillary inflorescences, or in a few cases plant cauliflorous; bracts often conspicuous, sometimes forming an involucre. **Calyx**: tube ellipsoid-oblong or ovoid; tubular part of limb sometimes cylindric and elongated; lobes often well-developed. **Corolla** usually ± white; tube mostly narrowly cylindric; lobes small, valvate. **Stamens** with very short filaments or ± sessile; anthers ± medifixed, narrowly oblong, arising towards base of tube in long-styled flowers and near throat in shorter-styled flowers but only tips exserted, if at all. **Ovary** 4- or 5-locular, with elliptic placentas usually externally covered with ovules; style slender, glabrous, divided into 5 long narrow astigmatic lobes, or style with 5 arms terminating in slightly thicker stigmatic lobes. **Fruits** globose, many-seeded, fleshy berries. **Seeds** irregularly ovoid, compressed, mostly angular, finely reticulate or striate.

Species 120, tropical America, trop. Africa and Madagascar; sthn trop. Afr. ± 6, Angola, Zambia.

Sacosperma G.Taylor

(Rubioideae—Hedyotideae)

Taylor: 218 (1944); Bremekamp: 43 (1952b); Hallé: 121 (1970).

Small woody lianes with twining stem. **Leaves** petiolate, base cuneate, apex ± attenuate or subacuminate; domatia present; stipules 2- or more-lobed. **Inflorescences** terminal, many-flowered, laxly paniculate; floral bracts minute or absent; flowers heterostylous, subsessile, turning black when dry; aestivation valvate. **Calyx** divided to base into 5 ± equal, ovate-triangular to linear lobes. **Corolla** tubular, much longer than calyx, glabrous outside, barbate inside in upper half; lobes 5, short, triangular. **Stamens** 5, arising in upper half of corolla tube, subsessile and included, or on short filaments arising at mouth of corolla tube (in short-styled flowers). **Disc** cushion-shaped, glabrous. **Ovary** 2-locular; placenta peltate, attached to middle of septum; ovules many; style glabrous, exserted from mouth of corolla tube, with 2 diverging stigmatic lobes. **Fruit** globose, 10-ribbed, tardily septicidally dehiscent into 2 apically partly loculicidally dehiscent cocci. **Seeds** many, small, angular, slightly dorsiventrally flattened, subcaruncular.

Species 2, trop. Africa; sthn trop. Afr. 1: *Sacosperma paniculatum* (Benth.) G.Taylor, Angola (Cabinda).

Sarcocephalus Afzel. ex Sabine

(Cinchonoideae—Naucleeae)

Sabine: 442 (1824); Good: 1 (1926b); Bridson & Verdcourt: 439 (1988); Bridson: 223 (1998).

Small to medium-sized trees; terminal vegetative buds flattened. **Leaves** opposite, petiolate, axils of nerves with or without domatia; stipules deltoid, obtuse or slightly notched at apex, ± persistent. **Inflorescences** terminal or terminal and lateral with unbranched axes; young inflorescence surrounded by reduced leaves and stipules not modified into bracts; true peduncle glabrous or pubescent, elongating. **Flowers** 4- or 5-merous. **Calyx** densely pubescent inside; lobes obtuse to triangular with or without deciduous or persistent appendages. **Corolla**: tube funnel-shaped; lobes oblong, imbricate in bud. **Stamens** arising in tube, not exserted; filaments short, glabrous; anthers basifixed, introrse. **Ovaries** of adjoining flowers entirely fused to each other, 2-locular; placentas ± discoidal, attached to middle of septum; ovules numerous in each locule, spreading in all directions; style exserted; stigma spindle-shaped. **Fruits** indehiscent, joined to form a fleshy syncarp. **Seeds** ovoid or ellipsoid, not winged.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda), Zambia.

Schumanniophyton Harms

(Cinchonoideae—Gardenieae)

Harms: 313 (1897); Good: 169 (1926a); Hallé: 21 (1970).

Chalazocarpus Hiern: 469 (1898); Good: 169 (1926a).

Slender, small to fairly tall trees, in habit somewhat reminiscent of *Carica papaya*, with straight, erect, usually unbranched stems bearing a few unbranched, slender, caducous branches in whorls of 3–5 mainly near top, each branch bearing 3 leaves at apex; scars left by fallen leaves oval, long visible. **Leaves** very large, often exceeding 1 x 0.5 m, petiolate or sessile, lanceolate to obovate, entire; stipules interpetiolar, triangular, protecting terminal bud of branch. **Inflorescence** sessile, borne just above the terminal leaf on a flat, circular, glabrous area with 50 to more than 100 densely crowded sessile flowers. **Flowers** bisexual. **Calyx** small, tubular, irregularly toothed. **Corolla** tube very long, cylindric; lobes 5–11, spreading, turned towards left in bud, lanceolate. **Stamens** as many as corolla lobes; anthers arising in upper part of corolla tube below mouth, sessile, medifixed. **Ovary** 2–5-locular; each locule with a peltate axile placenta bearing many anatropous ovules; style filiform, ending in 3 or 4(5) ± spreading stigmatic lobes just emergent or in mouth of tube. **Fruit** globose, with thick, ± dry wall, indehiscent, ± sessile, in clusters of 7–9, often long-persistent. **Seeds** ± 10–50 per fruit, brown or black; endosperm white, hard; embryo yellow with straight radicle and suborbicular cotyledons.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda).

Sericanthe Robbr.

(Cinchonoideae—Gardenieae—Diplosporinae)

Robbrecht: 27 (1978); Bridson & Verdcourt: 566 (1988); Bridson: 220, 226 (1998). White *et al.*: 499 (2001); Coates Palgrave: 1070 (2002).

Species 15, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sherbournia G.Don

(Cinchonoideae—Gardenieae)

Don: 1323 (1855); Hepper & Keay: 126 (1963); Hallé: 126 (1970); Bridson & Verdcourt: 521 (1988); Bridson: 222 (1998).

Amaralia Welw. ex Hook.f.; Keay: 57 (1958a); White: 398 (1962).

Scandent shrubs or lianes. **Leaves** opposite, petiolate, mostly thinly coriaceous; stipules rather large, oblong or elliptic, obtuse, deciduous. **Flowers** bisexual, in 1–several-flowered inflorescences on one side of stem at successive nodes, often ± sessile. **Calyx**: tube turbinate, sometimes ribbed; tubular part of free limb short; lobes 5, rather large, obtuse, contorted and overlapping to the right. **Corolla** rather large; tube funnel-shaped to campanulate, constricted at base, thickly silky outside, glabrous inside save for a densely barbate portion at base in constriction; lobes 5, short and broad, overlapping to the left. **Stamens**: anthers ± sessile, arising in throat of corolla; pollen grains single. **Ovary** 2(3)-locular, obconic; style clavate, sulcate; stigma scarcely separating into 2 lobes; ovules many, immersed in vertical rows on 2 placentas. **Fruit** oblong-ellipsoid. **Seeds** many, reticulate and wavy-rugulose.

Species 13, trop. Africa; sthn trop. Afr. 4, Angola (Cabinda), Zambia.

Spermacoce L.

(Rubioideae—Spermacoceae)

Verdcourt: 339 (1976); Verdcourt: 165 (1989); Bridson: 220 (1998); Bingham & Smith: 144 (2002); Izidine & Bândeira: 52 (2002).

Arbulocarpus Tennant: 386 (1958). *Borreria* G.F.W.Mey.; White: 401 (1962); Hepper & Keay: 218 (1963). *Mitracarpum* Zucc.; Good: 43 (1927). *Octodon*

Schumach. & Thonn.; White: 413 (1962). *Tardavel* Adans.; Hiern: 503 (1898).

Sthn trop. Afr. ± 30, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stelechantha Bremek.

(Cinchonoideae—Pauridiantheae)

Bremekamp: 218 (1940); Hallé: 236 (1964) as *Stelecantha*; Hallé: 264 (1966) as *Stelecantha*; Mabberley: 681 (1997).

Urophyllum Wall. in part as to *U. cauliflorum* R.Good.

Sparsely branched shrubs. **Leaves** opposite, equal; petiole canaliculate; lamina obovate or elliptic, acuminate, cuneate at base, coriaceous, glabrous, ± discolorous; stipules ovate or elliptic, pointed, broader than branch, coriaceous, glabrous, longitudinally striate. **Inflorescences** many-flowered clusters or small, short-peduncled cymes on old wood, minutely puberulous; bracts and bracteoles absent; buds pointed, subacuminate, black when dry. **Flowers** bisexual, 5-merous, heterostylous. **Calyx** cup-shaped, truncate. **Corolla**: tube cylindric, widening slightly towards base and towards apex, 2–3 times as long as lobes, bearded in throat; lobes valvate in bud, narrowly triangular. **Stamens** in short-styled flowers arising shortly beneath throat of corolla tube, exserted; anthers apiculate. **Disc** annular, slightly 5-angular, flat to slightly convex, glabrous. **Ovary** 2-locular at base, 4-locular in upper portion; ovules many; style glabrous, in brevistylous flowers included; stigmas 2, free. **Fruit** a fleshy, globose, red berry. **Seeds** globose.

Species 3, W trop. Africa; sthn trop. Afr. 1: *Stelechantha cauliflora* (R.Good) Bremek., Angola.

Stipularia P.Beauv.

(Cinchonoideae—Isertieae)

Palisot de Beauvois: 26 (1810–1811); Good: 7 (1926b); Hallé: 157 (1966); Bridson: 217, 218, 222 (1998); Phiri (Unpublished).

Sabicea Aubl. in part; Hepper: 289 (1958).

Erect perennial herbs, subshrubs or shrubs up to 3m high; young parts glabrous or ± pubescent. **Leaves** opposite, petiolate, narrowly elliptic to obovate, up to 350 mm long, densely whitish-tomentose underneath; stipules reddish, 30–40 mm long, broadly ovate, acute, persistent, glabrous or hairy at base. **Inflorescences** axillary, capitate, with several sessile heterostylous flowers enclosed in a deep, campanulate, (3)4-lobed bracteate involucre. **Calyx** tubular with 5 pubescent lobes. **Corolla** tubular; lobes 5, spreading. **Stamens**: anthers very narrowly elliptic, apiculate, subsessile, partly exserted in brevistylous flowers, deeply hidden in longistylous ones. **Ovary** (2)3–5-locular, glabrous, with long narrow placentas bearing many ovules; style glabrous, ending in (2)3–5 narrowly elliptic stigmatic lobes. **Fruit** succulent, fleshy, globose, bright red when ripe. **Seeds** many, small, brown.

Species 2, trop. Africa; sthn trop. Afr. 1: *Stipularia africana* P.Beauv., Angola, Zambia.

Tapiphyllum Robyns

(Ixoroideae—Vanguericae)

Robyns: 117 (1928); Robyns: 133 (1962); Verdcourt: 778 (1991); Bridson: 351 (1996); Bridson: 257 (1998); Coates Palgrave: 1080 (2002); Lantz *et al.*: 173 (2002).

Suffrutescent herbs with stems from a woody rhizome, subshrubs, shrubs or small trees; foliage, inflorescences and young shoots characteristically covered with a dense velvety tomentum. **Leaves** opposite or in whorls of 3 or 4, subsessile or shortly petiolate, usually markedly discolorous; stipules connate in lower part, drawn out into a linear apex, eventually deciduous. **Inflorescences** axillary, dense, usually opposite, with flowers few to many in ± globose cymes, or 1–few-flowered fascicles; bracts and bracteoles present, often fairly conspicuous. **Flowers** fairly small, but large in *T. rhodesiacum*, subsessile to shortly pedunculate. **Calyx** lobes 5, mostly erect and linear to linear-lanceolate, less often ovate to oblong-triangular. **Corolla** apiculate in bud; green, yellow or white, densely hairy outside; tube cylindric, glabrous, occasionally hairy at throat, with a ring of deflexed hairs within; lobes reflexed, usually apiculate. **Stamens** inserted at throat; anthers ± exserted. **Ovary** 4–5(6)-locular with one pendulous ovule per locule; style slender, usually exserted; pollen presenter cylindric or coroniform, sulcate and 4–5-lobulate. **Fruit** subglobose, usually crowned by persistent calyx, velvety or infrequently ± sparsely hairy, with 3–5 pyrenes, or fruit oblique and reduced to 1 pyrene.

Species ± 20, trop. Africa; sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique. "An ill-defined genus characterised by little but the velvety tomentum and mostly elongate calyx lobes but certainly having a recognisable facies" (Bridson 1998).

Tarenna Gaertn.

(Cinchonoideae—Pavetteae)

Hiern: 457 (1898); Bridson: 377 (1979b); Bridson & Verdcourt: 584 (1988); Bridson: 222, 225, 227 (1998); White *et al.*: 499 (2001); Coates Palgrave: 1042 (2002).

Sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Triainolepis Hook.f.

(Rubioideae—Triainolepideae)

Hooker: 126 (1873a); Verdcourt: 149 (1976); Verdcourt: 48 (1989); Bridson: 224 (1998); White *et al.*: 499 (2001).

Shrubs or small trees. **Leaves** opposite, petiolate; blades lanceolate to ovate or oblong-elliptic, often curved; stipules ovate or ovate-triangular, divided into 3–5 lobes. **Flowers** bisexual, heterostylous, (4)5-merous, in terminal corymbs; bracts small or minute. **Calyx**: tube campanulate, limb cupular, unequally 5–7-toothed. **Corolla** white, yellowish or tinged red, salver-shaped, tomentose to woolly outside; tube with throat and sometimes upper half inside densely barbate with white hairs; lobes lanceolate, hairy outside, glabrous inside. **Stamens** arising at top of corolla tube, exserted or included. **Disc** mostly glabrous. **Ovary** 4–10-locular, each locule with 2(3) collateral, erect, anatropous ovules; style filiform, glabrous, exserted or included; stigma lobes 4–10, filiform, straight or twisted, sometimes cohering. **Fruits** usually red, globose or depressed-globose, drupaceous, containing a woody or bony 4–10-celled

putamen, entire or slightly to deeply incised between locules; locules 1-seeded. **Seeds** ellipsoid, compressed, with membranous testa and fleshy albumen.

Species ± 10, trop. Africa and islands E of Africa; sthn trop. Afr. 2, Zambia, Malawi, Mozambique.

Tricalysia A.Rich. ex DC.

(Cinchonoideae—Gardenieae—Diplosporinae)

Good: 17 (1926b); White: 422 (1962); Robbrecht: 239 (1979); Robbrecht: 311 (1982); Robbrecht: 299 (1983); Robbrecht: 39 (1987); Robbrecht: 540 (1988a); Bridson: 220, 226 (1998); White *et al.*: 500 (2001); Coates Palgrave: 1063 (2002); Mapaura & Timberlake: 169 (2002).

Empogona Hook.f.

Sthn trop. Afr. ± 35, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Trichostachys Hook.f.

(?Rubioideae—Psychotrieae)

Hooker: 24, 128 (1873a), name conserved; Hiern: 226 (1877); Gossweiler & Mendonça: 57 (1939).

Perennial herbs or subshrubs. **Leaves** opposite, petiolate, lanceolate; stipules ovate to lanceolate. **Inflorescence** terminal, globose to oblong, involucrate heads or dense terete spikes. **Flowers** bisexual, small, white. **Calyx**: tube campanulate to obovoid; lobes 4–6, spreading, hispid or ciliate, persistent. **Corolla** funnel-shaped or subcampanulate, not much longer than calyx, throat hairy; lobes 4–6, ovate or lanceolate, spreading, valvate in bud. **Stamens** 4–6, arising in throat of corolla; filaments short; anthers included, linear, glabrous, fixed above base. **Disc** cushion-shaped or raised. **Ovary** 2-locular; ovules solitary, erect; style slender, glabrous, with 2 short obtuse branches. **Fruit** small, ovoid or subglobose; pyrenes 2, planoconvex, crustaceous. **Seeds** smooth; testa membranous; endosperm fleshy.

Species 10, trop. Africa; sthn trop. Afr. 2, Angola.

Uncaria Schreb.

(Cinchonoideae—Coptosapelteae)

Schreber: 125 (1789) name conserved; Ridsdale: 68 (1978); Bridson & Verdcourt: 449 (1988); Robbrecht: 175 (1993).

Ourouparia Aubl.; Hiern: 435 (1898).

Woody lianes or sometimes forming scrambling bushes or thickets; young stems ± quadrangular; flowering branches bearing strongly curved hooked spines. **Leaves** paired, petiolate, elliptic, apex acuminate; stipules simple or 2-lobed, deciduous. **Inflorescences** globose, solitary, axillary or terminal. **Flowers** not fused, pedicellate. **Calyx**: tube ellipsoid, free part well-developed, shallowly 5-undulate to distinctly 5-toothed, persistent. **Corolla**: tube filiform-cylindrical, funnel-shaped at throat; lobes 5, imbricate or quincuncial. **Stamens**: filaments very short; anthers apiculate, 2-thecous. **Ovary** 2-locular; placentas peltate, entirely covered with imbricated ascending ovules; style long and narrow, well exserted from corolla; stigma slightly thickened with 2 marks on either side. **Fruits** fusiform, dry, dehiscent, borne on accrescent pedicels. **Seeds** small, with long fine wings from opposite ends, mostly 1 from one end and 2 or 3 from the other.

Species 34, tropics, mainly Asia and Indonesia; sthn trop. Afr. 1: *Uncaria africana* G.Don, Angola.

Vangueria Comm. ex Juss.

(Ixoroideae—Vanguerieae)

Hiern: 480 (1898); Verdcourt: 848 (1991); Bridson: 245 (1998); White *et al.*: 502 (2001); Coates Palgrave: 1074 (2002); Lantz *et al.*: 180 (2002).

Tapiphyllum as to *T. parvifolium* (Sond.) Robyns; Van Wyk & Van Wyk: 274 (1997).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Vangueriella Verdc.

(Ixoroideae—Vanguerieae)

Verdcourt: 189 (1987); Verdcourt: 839 (1991); Bridson: 285 (1998); Lantz *et al.*: 173 (2002).

Vangueriopsis subgen. *Brachyanthus* Robyns: 249 (1928).

Straggling or scandent shrubs; branches (and sometimes stout spines?) in whorls of 3. **Leaves** in whorls of 3 (or sometimes paired?), petiolate, oblong, apex sharply acuminate; stipules with triangular base with subulate, eventually deciduous appendage. **Inflorescences** axillary, ± many-flowered distichous cymes. **Flowers** bisexual, small to medium-sized; bracts small or scarcely developed; buds lanceolate or cylindric, acute. **Calyx**: tube campanulate, adpressed-pubescent; lobes linear-lanceolate. **Corolla**: tube campanulate or cylindric; lobes oblong, usually shorter than tube. **Stamens**: anthers small, half-exserted, ovate or ovate-lanceolate; filaments very short. **Disc** glabrous. **Ovary** 2-locular; ovules 1 per locule, pendulous; style shortly exserted, cylindric to narrowly obconic; stigmatic club crown- or mitre-shaped, 2-lobed at apex. **Fruit** compressed bilobed, containing 2 pyrenes and crowned by calyx limb.

Species 21, trop. Africa; sthn trop. Afr. 1: *Vangueriella rhamnoides* (Hiern) Verdc., Angola.

Vangueriopsis Robyns

(Ixoroideae—Vanguerieae)

Good: 22 (1926b); Verdcourt: 187 (1987); Bridson & Verdcourt: 773 (1988); Bridson: 304 (1998); Coates Palgrave (2002); Lantz *et al.*: 173 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Virectaria Bremek.

(Rubioideae—Hedyotideae)

Good: 3 (1926b) as *Virecta*; Bremekamp: 21 (1952b); Verdcourt: 35 (1953b); Bridson & Verdcourt: 457 (1988); Verdcourt: 415 (1993); Bridson: 218, 226 (1998); Dessein *et al.*: 1 (2001).

Annual or perennial herbs or subshrubs with erect or procumbent, glabrescent to stiffly hairy stems from a fibrous rootstock. **Leaves** paired; stipules small, deltoid, entire to fimbriated. **Inflorescences** few- to many-flowered cymose clusters

at apices of main shoots. **Flowers** bisexual, small, never dimorphic. **Calyx**: tube ovoid or urceolate, often bristly hairy; lobes 5 or 6, equal or unequal, spathulate, filiform or lanceolate. **Corolla**: tube narrowly cylindric to funnel-shaped; lobes 4–6(7), deltoid to lanceolate, suberect. **Disc** cylindric, or consisting of 2 separate cones. **Stamens** 4–6, far exserted on slender filaments; anthers narrowly oblong, ± medifixed. **Ovary** 2-locular; ovules many, on placentas on central partition. **Fruit** a characteristic globose capsule splitting in a plane at right angles to the central partition into 2 valves of which 1 usually remains attached to the rachis. **Seeds** small, subglobose, reticulately pitted, brownish.

Species 7, trop. Africa; sthn trop. Afr. 3, Angola (Cabinda), Zambia.

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Rutaceae
(Rosidae—Sapindales)
(Eurosids II—Sapindales)

Victor, J.E. in Leistner: 495 (2000). General family reference: Stace *et al.*: 1 (1993).

Sthn trop. Afr.: genera 11, species ± 50.

Identification of additional genera using the key in the above reference:
***Citrus** will not run well in the key, but its winged articulated petioles and its well-known segmented, aromatic berries with leathery skin and pulp of small juicy sacs distinguish it clearly from the indigenous species.
Fagaropsis will run to 15b and partly to 20a, but it can be distinguished from *Zanthoxylum* by its opposite (not alternate) leaves; (6)8 stamens; 4-locular (not 1-locular) ovary; and baccate (not capsular) fruit.
***Ruta** will run to 1b, having pinnately divided leaves, but being a perennial herb it will run no further.

Calodendrum Thunb.

Mendonça: 181 (1963); Mendonça & Sousa: 3 (1973); White *et al.*: 508 (2001); Coates Palgrave: 414 (2002).

Species 2, tropical and sthn Afr.; sthn trop. Afr. 1: *Calodendrum capense* (L.f.) Thunb., Zimbabwe, Malawi, Mozambique, and in sthn Afr.

Citropsis (Engl.) Swingle & M.Kellerm.

Exell & Mendonça: 274 (1951); Mendonça: 193 (1963); Mendonça & Sousa: 13 (1973); Coates Palgrave: 422 (2002).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

***Citrus** L.

Exell & Mendonça: 275 (1951); Mendonça: 209 (1963); Mendonça & Sousa: 28 (1973); Gorman & Nelson: 113 (1997); Coates Palgrave: 422 (2002).

Evergreen shrubs or small trees, sometimes with spines beside

buds. **Leaves** alternate, simple, thick and leathery; petioles winged and usually jointed at junction with blades. **Flowers** bisexual or male, solitary or in racemes. **Petals** 4, or 5, white, sometimes reflexed. **Stamens** 20–40, at least 4 times as many as petals, joined in groups. **Fruit** a segmented, aromatic, gland-dotted berry with a thick leathery rind and a pulp of small juicy sacs.

Sthn trop. Afr. 2: **Citrus limon* (L.) Burm.f. and **C. sinensis* (L.) Osbeck have become naturalised in eastern Zimbabwe.

Clausena Burm.f.

Exell & Mendonça: 273 (1951); Mendonça: 191 (1963); Mendonça & Sousa: 12 (1973); White *et al.*: 508 (2001); Coates Palgrave: 421 (2002).

Sthn trop. Afr. 1:*Clausena anisata* (Willd.) Hook.f. ex Benth., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Fagaropsis Mildbr. ex Siebenl.

Siebenlist: 90 (1914); Gardner: 99 (1936); Exell & Mendonça: 272 (1951); Mendonça: 191 (1963); Mendonça & Sousa: 11 (1973); Kokwaro: 45 (1982); Mziray: 67 (1992); White *et al.*: 511 (2001).

Deciduous trees, usually with buttresses; young branches, leaves and inflorescences cinereous-pubescent, older branches glabrous. **Leaves** opposite, imparipinnate; leaflets opposite, 2–4(6)-jugate, subsessile or petiolulate, margin entire with a row of rather closely spaced pellucid gland dots. **Inflorescence** of cymose clusters in branched panicles and in sessile clusters on main rhachis, arising from buds at end of previous year's branches, before or together with new leafy branches. **Flowers** unisexual by abortion, pedicellate. **Sepals** 4, united at base, ovate, acute, whitish-pubescent. **Petals** 4 (sometimes 5 or 6 in the female flowers), imbricate in bud, oblanceolate. **Male flowers** with (6)8 stamens, shorter than petals; ovary vestigial, glabrous. **Female flowers** with staminodes; disc annular; ovary globose, 4-locular with 1 pendulous ovule in each locule; style very short; stigma slightly 4-lobed. **Fruit** baccate, subglobose, somewhat depressed, glandular-foveolate. **Seed** ovoid, pendulous; endosperm present.

Species 2, trop. Africa; sthn trop. Afr. 1: *Fagaropsis angolensis* (Engl.) Dale, Angola, Zimbabwe, Malawi.

Oricia Pierre

Mendonça: 195 (1963); Mendonça & Sousa: 15 (1973); Coates Palgrave: 415 (2002).

Sthn trop. Afr. 1: *Oricia bachmannii* (Engl.) I.Verd. (=*O. swynnertonii* (Baker f.) I.C.Verd., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Ruta L.

Exell & Mendonça: 266 (1951); Nelson: 103 (1997).

Perennial, aromatic (sometimes nauseatingly so), glabrous herbs. **Leaves** alternate, pinnately divided, spotted with glands. **Sepals** 4, lanceolate. **Petals** 4, in central flower 5, hooded, dark yellow, margin toothed or hairy. **Stamens** 8–10. **Styles** fused. **Fruit** a 4- or 5-celled capsule.

Recorded as occasional garden escapes, e.g. **Ruta chalepensis* L. in Angola.

Thamnosma Torr. & Frém.

Exell & Mendonça: 266 (1951); Mendonça: 183 (1963); Thulin: 5 (1999).

Sthn trop. Afr. 2, Angola, Zimbabwe, and sthn Afr.

Toddalia Juss.

Mendonça: 197 (1963); Mendonça & Sousa: 16 (1973); Mziray: 68 (1992); White *et al.*: 511 (2001); Coates Palgrave: 417 (2002).

Monotypic genus: *Toddalia asiatica* (L.) Lam., widely distributed in tropical and subtropical Old World; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Vepris Comm. ex A.Juss.

Exell & Mendonça: 272 (1951); Mendonça: 199 (1963); Mendonça & Sousa: 17 (1973); Mziray: 69 (1992); White & Pannell: 419 (1996); Gereau: 43 (2001); White *et al.*: 513 (2001); Bingham & Smith: 144 (2002); Coates Palgrave: 415 (2002); Mapaura & Timberlake: 169 (2002); Msekandiana & Mlangeni: 38 (2002).

Diphasia Pierre: 70 (1898); Exell & Mendonça: 271 (1951); Gilbert: 104 (1958); Kokwaro: 30 (1982). *Diphasiopsis* Mendonça: 81 (1961). *Teclea* Delile: 90 (1843), name conserved; Exell & Mendonça: 270 (1951); Mendonça: 205 (1963); Mendonça & Sousa: 23 (1973); Dowsett-Lemaire & White: 81 (1990); Coates Palgrave: 418 (2002); Izidine & Bandeira: 60 (2002); Mapaura & Timberlake: 176 (2002). *Toddaliopsis* Engl.; Mendonça: 205 (1963); Mendonça & Sousa: 22 (1973); Coates Palgrave: 418 (2002).

Sthn trop. Afr. 22, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Zanthoxylum L.

Dowsett-Lemaire & White: 82 (1990); Beurton: 165 (1994); White *et al.*: 516 (2001); Coates Palgrave: 409 (2002); Mapaura & Timberlake: 169 (2002).

Fagara L., Exell & Mendonça: 267 (1951); Burtt Davy *et al.*: 91 (1958);White: 170 (1962); Mendonça: 183 (1963); Mendonça & Sousa: 4 (1973); Izidine & Bandeira: 52 (2002).

Sthn trop. Afr. ± 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Salicaceae
(in broad sense)
(Dilleniidae—Violales)
(Eurosids I—Malpighiales; includes Flacourtiaceae (in broad sense) in part)

Trees or shrubs, sometimes dioecious, sometimes spiny. **Leaves** alternate, sometimes fascicled, simple, entire or toothed, often with salicoid dentation; stipules present, sometimes foliaceous and subpersistent, or 0. **Inflorescences** axillary or terminal, sometimes epiphyllous, racemose, spicate, corymbose, paniculate, fasciculate, or flowers solitary. **Flowers** bisexual or unisexual, at least functionally, often small and inconspicuous. **Sepals** (0–)3–8(–15), free or connate below, sometimes connate with lower part of ovary, contorted or imbricate, rarely valvate. **Petals** usually either 0 or equal in number and similar to sepals, free. **Disc** cup-shaped and ± adnate to adaxial surface of calyx, or annular or divided into separate glands. **Stamens** 2–many, free or rarely connate, sometimes alternating with staminodes, arising singly or in groups on receptacle, between disc lobes or glands, or in flowers with cup-shaped disc on disc rim in sinuses between lobes; anthers mostly small, ovoid to ellipsoid, rarely linear, 2-thecous, opening by longitudinal slits. **Ovary** superior or more rarely semi-inferior, 1-locular, sometimes incompletely septate by intrusion of placentae; with (1)–many ovules on 2–8 parietal placentas, rarely ovules axile or basal; styles 1–8, entire or branched. **Fruit** baccate or capsular and usually (2)3(–6)-valved, sometimes a drupe. **Seeds** usually small, sometimes arillate, sometimes with a basal tuft of long dense hairs; endosperm fleshy, copious, rarely thin or 0.

Sthn trop. Afr.: genera 12, species 33.

References in Leistner (2000): Flacourtiaceae: Bredenkamp, C.L.: 304; Salicaceae: Jordaan, M.: 499.

See under Flacourtiaceae (in broad sense), p 208, and under Chase *et al.* 2002, for a discussion on the suggested treatment of this family.

Key to genera

1a Perianth absent ..... **Salix**

1b Perianth present, either of sepals only or of both sepals and petals:

2a Petals absent; anthers mostly shorter than 1 mm and not much longer than broad:

3a Leaves with linear or circular pellucid glands; stamens connate at the base with the alternating disc glands ..... **Casearia**

3b Leaves generally without pellucid glands (very fine glands are very rarely present in *Dovyalis*); stamens free:

4a Stamens in bundles of ± 10 alternating with the sepals; fruit a capsule ..... **Bivinia**

4b Stamens irregularly arranged; fruit a berry or a berry-like drupe:

5a Ovary 1-locular; flowers bisexual; spines absent ..... **Ludia**

5b Ovary falsely 3–8-locular; flowers unisexual, rarely bisexual; spines generally present:

6a Stamens surrounded by a ring of disc glands; ovary with 2 ovules per locule, one above the other; fruit a berry-like drupe with 1-seeded pyrenes in pairs ..... **Flacourtia**

6b Stamens intermingled with disc glands and alternating with them; ovules 1–6 per placenta; fruit a berry with 1 or 2 seeds ..... **Dovyalis**

2b Petals present, sometimes similar to sepals; anthers of varying size:

7a Inflorescence epiphyllous (on petiole or on midrib of leaf lamina):

8a Sepals, petals and stamens all 5; style entire; flowers always bisexual ..... **Mocquerysia**

8b Sepals and petals 3 or 4(5); stamens 20–40; flowers unisexual or bisexual (plants polygamous) ..... **Phyllobotryon**

7b Inflorescence axillary, terminal or cauline:

9a Flowers up to 90 mm in diameter with a conspicuous central golden mass of stamens; anthers mostly longer than 2 mm, linear; plant often spiny ..... **Oncoba**

9b Flowers less than 80 mm in diameter; stamens fewer and less conspicuous than above; anthers shorter than 1 mm, not much longer than broad; plant not spiny:

10a Stamens many, not collected in bundles opposite petals; fruit a berry ..... **Scolopia**

10b Stamens equal in number to petals or in bundles opposite petals; fruit usually a capsule:

11a Leaves with 5–9 nerves from base; flowers unisexual; seeds with a red aril ..... **Trimeria**

11b Leaves penninerved; flowers bisexual; seeds without an aril:

12a Style simple with a capitate or minutely bilobed stigma; flowers in pedunculate cymes; stipules deltoid ..... **Gerrardina**

12b Styles 2–6 or 2–6-cleft; flowers in racemes or panicles; stipules absent or large and orbicular or reniform ..... **Homalium**

Bivinia Jaub. ex Tul.

(Homalieae)

Jaubert & Tulasne: 78 (1857); Wild: 294 (1960); Wild & Vidigal: 37 (1973); Sleumer: 51 (1975); Coates Palgrave: 758 (2002); Mapaura &Timberlake: 165 (2002).

Tall trees; bark light grey; branches thin; branchlets greyish brown with pale lenticels, with a thin grey pubescence when young. **Leaves** alternate, petiolate, ovate, broadly elliptic or somewhat obovate, long-acuminate at apex, crenate-dentate; stipules absent. **Flowers** bisexual, in axillary or rarely terminal, dense, cylindric racemes; pedicels articulated near middle; bracts small and linear; receptacle very shallow. **Sepals** 5 or 6, valvate, with broad, truncate, pubescent glands adnate to base of each sepal. **Petals** 0. **Stamens** in fascicles of ± 10 alternating with sepals; filaments folded in bud; anthers globose, very small. **Ovary** 1-locular with 4–6 multi-ovulate placentas; styles 4–6, filiform. **Fruit** a small dry capsule with 4–6 valves. **Seeds** few, with long hairs; endosperm fleshy; cotyledons thin and flat.

Monotypic genus: *Bivinia jalbertii* Tul., Madagascar and E trop. Africa; sthn trop. Afr.: Zimbabwe, Mozambique.

Casearia Jacq.

(Samydeae)

Wild: 293 (1960); Fernandes: 204 (1970); Sleumer: 397 (1971); Wild & Vidigal: 35 (1973); Sleumer: 47 (1975); Killick: 91 (1976); Bredenkamp: 305 (2000); White *et al.*: 266 (2001); Coates Palgrave: 766 (2002).

Sthn trop. Afr. 4, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dovyalis E.Mey. ex Arn.

(Flacourtieae)

Sleumer: 85, 361 (1937/1951); Wild: 281 (1960); Sleumer: 64 (1972); Wild & Vidigal: 22 (1973); Sleumer: 59 (1975); Langenegger: 84 (1976); Bredenkamp: 305 (2000); White *et al.*: 268 (2001); Coates Palgrave: 761 (2002); Msekandiana & Mlangeni: 36 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Flacourtia L'Hér.

(Flacourtieae)

Hiern: 40 (1896); Sleumer: 85, 361 (1937/1951); Wild: 285 (1960); White: 265 (1962); Wild & Vidigal: 27 (1973); Killick: 82 (1976); Bredenkamp: 305 (2000); White *et al.*: 272 (2001); Coates Palgrave: 760 (2002).

Sthn trop. Afr. 1: *Flacourtia indica* (Burm.f.) Merr. (=*F. flavescens* Willd.), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gerrardina Oliv.

(Homalieae)

Wild: 287 (1960); Wild & Vidigal: 30 (1973); Sleumer: 37 (1975); Killick: 72 (1976); Bredenkamp: 305 (2000); White *et al.*: 272 (2001); Mapaura (Unpublished).

Sthn trop. Afr. 1: *Gerrardina eylesiana* Milne-Redh., Zimbabwe, Malawi, Mozambique.

Homalium Jacq.

(Homalieae)

Wild: 287 (1960); Fernandes: 205 (1970); Sleumer: 239 (1973); Wild & Vidigal: 31 (1973); Sleumer: 42 (1975); Killick: 74 (1976); Hul: 62 (1995); Bredenkamp: 306 (2000); White *et al.*: 273 (2001); Bingham & Smith: 144 (2002) under Samydaceae; Coates Palgrave: 756 (2002); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 165 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ludia Comm. ex Juss.

(Flacourtieae)

Burtt Davy *et al.*: 55 (1958); Wild & Vidigal: 21 (1973); Sleumer: 53 (1975); Dowsett-Lemaire & White: 78 (1990); White *et al.*: 274 (2001); Coates Palgrave: 759 (2002).

Unarmed small trees or shrubs. **Leaves** alternate, petiolate, persistent, entire, oblong, oblanceolate, obovate or elliptic, apex usually shortly attenuate, base cuneate, nerves in 6–8 pairs, steeply ascending; stipules 0. **Flowers** bisexual, small, solitary or rarely 2 or 3 together from same axil, subsessile, subtended by several minute suborbicular bracts. **Sepals** 5 or 6, in one whorl, imbricate, densely pubescent outside and in upper part of inside, reflexed at anthesis. **Petals** 0. **Stamens** 40–60, arising on a flat receptacle with several small glands, among many hairs; filaments filiform; anthers small, connective generally rather obscure. **Ovary** glabrous, 1-locular, with 2–4 parietal placentas bearing few to many ovules; style columnar, 2–4-lobed or -partite at apex. **Fruit** baccate, with persistent style, 1-locular, hardly or tardily and irregularly dehiscent; pericarp coriaceous. **Seeds** few; testa hard.

Species ± 23, mainly Madagascar and Mascarenes, 1 in tropical eastern Africa: *Ludia mauritiana* J.F.Gmel.; sthn trop. Afr.: Malawi, Mozambique.

Mocquerysia Hua

(Scolopieae)

Hua: 259 (1893); Exell: 20 (1926); Sleumer: 86 (1937/1951); Hul: 164 (1991); Hul: 27 (1995).

Unarmed, single-stemmed shrubs. **Leaves** alternate, simple,

petiolate, narrowly obovate, cuneate at base, long-acuminate at apex, dentate to denticulate, glabrous; stipules linear-acuminate, glabrous. **Inflorescences** epiphyllous, usually in 1-flowered cymes in 2–6 groups per leaf on petiole or on midrib in lower $^3/_4$ of lamina. **Flowers** bisexual; pedicel pubescent, ± as long as flower; bracts narrowly ovate. **Sepals** 5, imbricate, very narrowly ovate to linear-ovate, pubescent, persistent. **Petals** 5, imbricate, narrowly ovate to linear-ovate, pubescent, persistent. **Stamens** 5; filaments very short, glabrous; anthers lanceolate, glabrous or glabrescent. **Ovary** 1-locular, with 3 multi-ovulate parietal placentas, tomentose; style simple, truncate, persistent in fruit. **Fruit** an ovoid capsule, pubescent to glabrescent, surrounded by perianth

Monotypic genus: *Mocquerysia multiflora* Hua, trop. Africa; sthn trop. Afr.: Angola (Cabinda).

Oncoba Forssk.

(Tribal affinities not yet known)

Exell: 20 (1926); Sleumer: 81, 361 (1937/1951); Burtt Davy *et al.*: 55 (1958); Wild: 275 (1960); Wild & Vidigal: 15 (1973); Killick: 56 (1976); Hul: 40 (1995); Bredenkamp: 306 (2000); White *et al.*: 274 (2001); Coates Palgrave: 749 (2002).

Caloncoba Gilg in part; Sleumer: 120 (1974a); Wild & Vidigal: 10 (1973). *Camptostylus* Gilg; Sleumer: 283 (1974b).

Sthn trop. Afr. 1(4): *Oncoba spinosa* Forssk., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.; 4 species if *Caloncoba* is included.

Phyllobotryon Müll.Arg.

(Scolopieae)

Müller Argoviensis: 534 (1864); Hul: 155 (1991); Hul: 23 (1995).

Phylloclinium Baill.; Exell & Mendonça: 361 (1937/1951); Sleumer: 29 (1975).

Erect, glabrous shrubs, not or little branched. **Leaves** alternate, clustered near tips of branchlets, petiolate, persistent, elongate-obovate or -spathulate, apex rounded but tip abruptly long-acuminate, long-attenuate towards base, subcoriaceous, ± sharply serrate-dentate; lateral nerves 14–18 pairs, prominent on both faces; stipules lanceolate, caducous. **Inflorescence** epiphyllous, 1–3(4)-flowered, on midrib of upper $^2/_3$–$^3/_4$ of lamina, glabrous; median bract ovate-lanceolate, accrescent. **Flowers** bisexual or unisexual (plants polygamous), pedicelled. **Sepals** 3 or 4(5), imbricate, rather irregular and dry, ovate, ciliolate. **Petals** 4–6, imbricate, thin, much larger than sepals, ciliate. **Stamens** 25–40, free; filaments subulate; anthers almost basifixed, longitudinally dehiscent, apiculate by protruding connective. **Ovary** superior, glabrous, 1-locular, with 2–4 multi-ovulate parietal placentas; style simple, shortly 2–4-fid. **Capsule** opening with 2 or 3 valves; pericarp woody. **Seeds** weakly arillate, with endosperm.

Species 5, trop. Africa; sthn trop. Afr. 1: *Phyllobotryon paradoxum* (Baill.) Hul, Angola.

Salix L.

(Saliceae)

White: 20 (1962); Verdcourt: 1 (1985); Wilmot-Dear: 121 (1991); Jordaan: 499 (2000); White *et al.*: 519 (2001); Coates Palgrave; 121 (2002); Jordaan (in press).

Sthn trop. Afr. 1: *Salix mucronata* Thunb., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. **Salix babylonica* L. and **S. fragilis* L. have become naturalised in many areas.

Scolopia Schreb.

(Scolopieae)

Sleumer: 84 (1937/1951); Wild: 276 (1960); Wild & Vidigal: 17 (1973); Killick: 63 (1976); Dowsett-Lemaire & White: 78 (1990); Bredenkamp: 306 (2000); White *et al.*: 278 (2001); Coates Palgrave: 752 (2002); Mapaura &Timberlake: 165 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Trimeria Harv.

(Homalieae)

Wild: 296 (1960); Wild & Vidigal: 38 (1973); Sleumer: 302 (1974c); Sleumer: 39 (1975); Killick: 77 (1976); Bredenkamp: 306 (2000); Coates Palgrave: 758 (2002).

Sthn trop. Afr. 1: *Trimeria grandifolia* (Hochst.) Warb., Zimbabwe, Mozambique, and sthn Afr.

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Salvadoraceae

(Dilleniidae—Capparidales)
(Eurosids II—Brassicales)

Victor, J.E. in Leistner: 500 (2000). General family reference: Carlquist: 10 (2002).

Sthn trop. Afr.: genera 3, species 4.

Identification of additional genus using the key in the above reference: **Dobera** will run to *Salvadora* from which it can be distinguished by the free (not shortly united) petals; and stamens arising at base of petals (not on the petals).

Azima Lam.

Hiern: 659 (1898); Verdcourt: 1 (1968); Vickery: 375 (1983); Coates Palgrave: 921 (2002).

Sthn trop. Afr. 1: *Azima tetracantha* Lam., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dobera Juss.

Jussieu: 425 (1789); Verdcourt: 3 (1968); Vickery: 375 (1983).

Platymitium Warb.: 279, t. 31 (1895).

Much-branched, evergreen, unarmed trees. **Leaves** elliptic or obovate, subcoriaceous or thin, glaucous, almost glabrous, petiolate. **Flowers** bisexual, sessile in axillary or terminal panicles, small, greenish white. **Calyx** ovoid, 3- or 4(5)-toothed, sometimes ± bilobed. **Petals** 4(5), free, elliptic, oblong or linear-oblong, sometimes ± spathulate, imbricate. **Stamens** 4(5), hypogynous; filaments dilated basally, shortly connate forming a tube, free and filiform above; anthers ovate. **Disc** composed of 4 glands each at base of a petal and alternating with stamens. **Ovary** 1-locular; style short; stigma obtuse or truncate; ovules 2. **Fruit** a subglobose or ellipsoidal 1-seeded drupe.

Species 2, both occurring in trop. Africa, one extending to southern Arabian Peninsula and India; sthn trop. Afr. 1: *Dobera loranthifolia* (Warb.) Harms, Mozambique.

Salvadora L.

Hiern: 659 (1898); Verdcourt: 7 (1968); Vickery: 377 (1983); Coates Palgrave: 921 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Santalaceae
(Rosidae—Santalales)
(Core Eudicots—Santalales)

Jordaan, M. & Burgoyne, P. in Leistner: 501 (2000).

Sthn trop. Afr.: genera 3, species 57.

Osyridicarpos A.DC.

Baker & Hill: 431 (1911); White *et al.*: 520 (2001).

Sthn trop. Afr. 1: *Osyridicarpos schimperianus* (Hochst. ex A.Rich.) A.DC., Zambia, Zimbabwe, Malawi, and sthn Afr.

Osyris L.

Hiern: 938 (1900); Baker & Hill: 433 (1911); White: 40 (1962); Hilliard: 391 (1994); Coates Palgrave: 194 (2002); Bingham (Unpublished).

Colpoon P.J.Bergius; Bean: 665 (1990).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Thesium L.

Hiern: 936 (1900); Baker & Hill: 411 (1911); Lawalrée: 65 (1972); Hilliard: 53 (1991); White *et al.*: 520 (2001); Mapaura (Unpublished).

Sthn trop. Afr. 55, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Sapindaceae
(Rosidae—Sapindales)
(Eurosids II—Sapindales)

Archer, R.H. in Leistner: 503 (2000).

Sthn trop. Afr.: genera 25, species 72.

Key to genera

[adapted from Davies & Verdcourt (1998)]

1a Flowers appearing when plant is leafless:
  2a Flowers bisexual; petals 4; stamens 8, arising in a bundle where the 5th petal is deficient ..... **Erythrophysa**
  2b Flowers unisexual; petals absent; stamens 4–7, not arising in a bundle:
    3a Disc cushion-shaped; stamens arising in pockets in the disc; ovary 3-locular, locules 1-ovulate ..... **Haplocoelum**
    3b Disc flat or cup-shaped; stamens arising within the disc; ovary 2-locular, locules 2-ovulate ..... **Zanha**
1b Flowers and leaves appearing together:
  4a Leaves simple:
    5a Leaves sticky-glandular and shiny, at least when young, margin entire ..... **Dodonaea**
    5b Leaves not sticky, margin entire, crenate or serrate:
      6a Leaf apex narrowly acuminate or acute, rarely bluntly acuminate; buds covered by imbricate sepals; leaf nervation not forked towards margin ..... **Allophylus**
      6b Leaf apex obtuse, emarginate or rarely shortly acuminate; buds opening precociously; leaf nervation prominent and forked near margin ..... **Pappea**
  4b Leaves compound:
    7a Plants climbing by tendrils:
      8a Leaves pinnate, the rachis winged ..... **Paullinia**
      8b Leaves biternate, the rachis not winged ..... **Cardiospermum**
    7b Plants not climbing by tendrils:
      9a Leaves bipinnate ..... **Macphersonia**

9b Leaves pinnate:
10a Stamens 4 or 5:
11a Petals 5 (sometimes minute):
12a Leaf rachis winged; petals minute, without a scale ... **Filicium**
12b Leaf rachis not winged; petals with hair-fringed scales ... **Lepisanthes**
11b Petals absent:
13a Lower leaflets much reduced, tending to resemble stipules ... **Glenniea**
13b Lower leaflets slightly smaller than the upper ones:
14a Stamens arising in pockets in the cushion-shaped disc; ovary 3-locular, locules 1-ovulate ... **Haplocoelum**
14b Stamens arising inside the disc; ovary 2-locular, locules 2-ovulate ... **Zanha**
10b Stamens 6–14(–30):
15a Petals 3 or 4; flowers radially or bilaterally symmetrical:
16a Leaves trifoliolate ... **Allophylus**
16b Leaves usually with 2 or more pairs of leaflets, rarely abnormally trifoliolate:
17a Flowers radially symmetric; sepals 5, free; petals 4, without claw and without a scale ... **Majidea**
17b Flowers bilaterally symmetric; sepals 4 or 5, partly fused into a campanulate, urceolate or cup-shaped calyx; petals 3 or 4 with a claw and a basal scale:
18a Single-stemmed shrubs or small trees with palm-like habit with a crown of large leaves; ovary 3–9-locular with 1 ovule per locule:
19a Fruit not ribbed or lobed, 5–7-locular; leaves mostly longer than 1 m; anther filaments thickening towards the base ... **Radlkofera**
19b Fruit ribbed or lobed, 3–9-locular; leaves up to 1 m long; anther filaments not thickening towards the base ... **Chytranthus**
18b Branched shrubs or small trees; leaves much shorter than 1 m; ovary with 3 locules with 1 or 2 ovules per locule:
20a Fruit an inflated, beaked bladder; ovary with 2 ovules per locule ... **Erythrophysa**
20b Fruit either a 3-lobed drupe or of 1–3 free mericarps; ovary with 1 ovule per locule ... **Pancovia**
15b Petals absent or 5; flowers symmetric:
21a Petals absent:
22a Sepals opening precociously in bud before the elongation of the filaments ... **Stadmannia**
22b Sepals remaining imbricate around the elongated and folded filaments in bud:
23a Inflorescence arising from the trunk or branches; fine network of veins on leaflets very prominent; ovary deeply 3-lobed ... **Placodiscus**
23b Inflorescence from leaf axils; fine network of veins on leaflets not prominent; ovary not lobed ... **Lecaniodiscus**
21b Petals 5:
24a Petals 2–5 x as long as sepals, with short free broad hairy scales; stamens 8; leaves with lowermost leaflet pair stipule-like ... **Eriocoelum**
24b Plant without the above characters combined:
25a Filaments glabrous throughout ... **Haplocoelopsis**
25b Filaments hairy, at least for part of their length:
26a Buds opening precociously to reveal sessile anthers; leaflets in 1–5 pairs ... **Blighia**
26b Buds covered by imbricate sepals; leaflets in 2–18 pairs:
27a Tree with palm-like habit; stamens 14–20 ... **Deinbollia**
27b Branched trees; stamens 6–10:
28a Ovary 3-lobed, narrowly 3-winged; stamens 8; fruit of 2 or 3 broadly winged mericarps ... **Atalaya**
28b Ovary 2-lobed, not winged; stamens 5–8; fruit of 2 or 3 ellipsoid or compressed, but not winged, mericarps:
29a Vegetative parts and sepals glabrous; fruit of 1–3 ellipsoid indehiscent mericarps ... **Lepisanthes**
29b Vegetative parts and sepals greyish green or rusty tomentose; fruit of (1)2 dehiscent mericarps ... **Aporrhiza**

Allophylus L.

Exell & Mendonça: 76 (1954/1956); Exell: 496 (1966); Exell & Mendonça: 97 (1973); Exell & Sousa: 3 (1973); Friis *et al.*: 802 (1996); White *et al.*: 522 (2001); Coates Palgrave: 640 (2002); Mapaura & Timberlake: 169 (2002).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aporrhiza Radlk.

Radlkofer: 338 (1878); Exell: 514 (1966); Exell & Sousa: 21 (1973);White *et al.*: 525 (2001); Coates Palgrave: 653 (2002).

Trees, functionally monoecious; bark grey-brown or grey-green; branchlets fulvous-tomentose or -pubescent. **Leaves** paripinnate; leaflets 2–4-jugate, oblong-elliptic or elliptic. **Inflorescence** a terminal or axillary paniculate thyrse. **Flowers** functionally unisexual, regular. **Sepals** 5, free almost to base, ovate to ovate-elliptic. **Petals** 5, slightly shorter than sepals, unguiculate, cream or creamy white, each with 2 hairy scales formed by inflexed margin above claw. **Disc** deeply lobed, glabrous. **Stamens** 6–8; filaments pilose. **Ovary** 2-locular, pilose, locules 1-ovulate; style short, 2-lobed. **Fruit** capsular, of 2 divergent, platter-shaped, loculicidally dehiscent cocci. **Seeds** 1 in each locule, with an arillode covering lower half.

Species 6, trop. Africa; sthn trop. Afr. 1: *Aporrhiza paniculata* Radlk. (=*A. nitida* Gilg), Zambia, Zimbabwe, Malawi, Mozambique.

Atalaya Blume

Exell: 518 (1966); Exell & Sousa: 24 (1973); Coates Palgrave: 645 (2002).

Sthn trop. Afr. 1: *Atalaya alata* (Sim) H.M.L.Forbes, Mozambique, and sthn Afr.

Blighia K.D.Koenig

Exell & Mendonça: 88 (1954/1956); Exell: 514 (1966); Exell & Sousa: 23 (1973); White *et al.*: 527 (2001); Coates Palgrave: 653 (2002).

Phialodiscus Radlk.; Exell: 88 (1928); Burtt Davy *et al.*: 93 (1958).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and in sthn Afr.

Cardiospermum L.

Exell & Mendonça: 73 (1954/1956); Bowden: 508 (1966); Exell & Sousa: 16 (1973); White *et al.*: 527 (2001).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chytranthus Hook.f.

Hooker: 403 (1862); Exell & Mendonça: 82 (1954/1956); Fouilloy & Hallé: 82 (1973); Davies & Verdcourt: 63 (1998).

Glossolepis Gilg; Exell: 87 (1928).

Small trees or shrubs, usually single-stemmed and often with a palm-like habit, polygamous or dioecious. **Leaves** paripinnate, up to 1 m and longer, with ± 4–8 pairs of ± opposite leaflets; stipules absent. **Inflorescences** spicate racemes arranged in rows or groups on old wood or roots. **Flowers** slightly irregular with petals crowded to one side and stamens or ovary on opposite side. **Calyx** ± urn-shaped, (4)5-lobed, finely, densely tomentose; lobes $^1/_4$–$^1/_2$ as long as calyx. **Petals** 4 or 5(6), unequal, slightly longer than calyx, linear-spathulate, with a short scale and sometimes also a short subulate process above the claw. **Disc** annular, asymmetrical, lobed. **Stamens** 6–8(15); filaments filiform, conspicuously hairy; anthers 2-thecous, dorsifixed, linear-oblong. **Ovary** 3–9-locular and -lobed, with 1 erect ovule per locule; style present, sometimes arched in female flowers; stigma entire to slightly lobed. **Fruit** a large and fleshy, lobed or ribbed drupe. **Seed** 1 per locule, without aril.

Species 30 or more, trop. Africa; sthn trop. Afr. ± 6, Angola (Cabinda).

Deinbollia Schumach. & Thonn.

Exell & Mendonça: 79 (1954/1956); Exell: 521 (1966); Exell & Sousa: 25 (1973); Dowsett-Lemaire & White: 83 (1990); Davies & Verdcourt: 68 (1998); White *et al.*: 529 (2001); Coates Palgrave: 646 (2002); Msekandiana & Mlangeni: 38 (2002).

Sthn trop. Afr. ± 14, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dodonaea Mill.

Exell & Mendonça: 91 (1954/1956); Exell: 542 (1966); Exell & Sousa: 44 (1973); White *et al.*: 529 (2001); Coates Palgrave: 655 (2002).

Sthn trop. Afr. 1, *Dodonaea viscosa* (L.) Jacq., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Eriocoelum Hook.f.

Hooker: 400 (1862); Exell & Mendonça: 90 (1954/1956); Exell: 516 (1966); Fouilloy & Hallé: 170 (1973).

Small slender trees, spuriously polygamous, often monoecious; bark smooth, grey; branchlets fulvous-tomentose. **Leaves** paripinnate, shortly petiolate or subsessile; leaflets 3- or 4-jugate, oblong-elliptic, lowest pair often resembling stipules. **Inflorescence** a ± terminal or axillary, paniculate or racemoid thyrse. **Flowers** regular, whitish, sweetly scented. **Sepals** 5, almost free. **Petals** 5, each with a short broad pilose or pubescent scale. **Disc** patelliform or collar-like with a free scarious margin. **Stamens** 8; staminodes shorter in female flowers. **Ovary** 3 locular, densely hairy, locules 1-ovulate; pistillode subglobose in male flowers. **Fruit** capsular, 3-gonous, 3-locular, loculicidally dehiscent; valves lanuginous at base within. **Seeds** 1 per locule, ellipsoid, with an arillode at base.

Species 10, trop. Africa; sthn trop. Afr. 4, Angola, Zambia.

Erythrophysa E.Mey. ex Arn.

Coates Palgrave: 655 (2002); Mapaura & Timberlake: 169 (2002).

Sthn trop. Afr. 1: *Erythrophysa transvaalensis* I.Verd., Zimbabwe, and sthn Afr.

Filicium Thw. ex Hook.f.

Hooker: 325 (1962); Exell: 534 (1966); Exell & Sousa: 31 (1973); Davies & Verdcourt: 12 (1998); White *et al.*: 531 (2001); Coates Palgrave: 658 (2002).

Small trees or shrubs; branchlets glabrous. **Leaves** paripinnate with winged rachis; leaflets up to 11-jugate, sessile, very narrowly oblong to oblong-elliptic, entire, glandular-punctate and shiny above, otherwise glabrous. **Inflorescence** a terminal or axillary paniculate thyrse. **Flowers** functionally male or female. **Sepals** 5, free almost to base, ciliolate, persistent. **Petals** 5, ovate, ciliolate. **Disc** lanate. **Stamens** 5, inserted between lobes of disc, sterile in female flowers. **Ovary** 2-locular; locules 1-ovulate; ovule pendent from apex of locule; pistillode present in male flowers. **Fruit** drupaceous, 1- or 2-locular, glabrous. **Seeds** 1 or 2, without arillode.

Species 3, Old World tropics; sthn trop. Afr. 1: *Filicium decipiens* (Wight & Arn.) Thwaites, Zimbabwe, Malawi, Mozambique.

Glenniea Hook.f.

Hooker: 404 (1862); Leenhouts: 411 (1975); Davies & Verdcourt: 52 (1998); Coates Palgrave: 649 (2002).

Melanodiscus Radlk., Exell & Mendonça: 92 (1954/1956); Exell: 528 (1966); Exell & Sousa: 34 (1973); White *et al.*: 533 (2001). *Crossonephelis* Baill.; Leenhouts: 91 (1973).

Dioecious, monoecious or polygamous shrubs or trees; bark grey, smooth. **Leaves** alternate, simple or pinnate; leaflets in 1–6 pairs, uppermost largest, lowermost much smaller, oblanceolate, elliptic to lanceolate, entire but sometimes undulate, glabrous except main veins underneath, main lateral veins in 4–14 pairs. **Inflorescence** terminal, axillary or cauliflorous, paniculate or thyrsoid with few spreading

branches. **Flowers** regular. **Sepals** 3–5, ± free. **Petals** 0 or 5. **Stamens** 4–8, well exserted. **Ovary** 2- or 3-lobed; ovules 1 per locule; style 2- or 3-locular and -lobed. **Seeds** without aril.

Species 8, Malesia, Sri Lanka, Madagascar and trop. Africa; sthn trop. Afr. 2, Angola, Zimbabwe, Malawi, Mozambique.

Haplocoelopsis F.G.Davies

Davies: 231 (1997); Davies & Verdcourt: 30 (1998).

Shrubs or small trees with dense leafy crown; probably monoecious. **Leaves** pinnate; leaflets entire, lowermost ones reduced, stipule-like, one of the pair inserted on or shortly above petiole, sometimes caducous. **Inflorescence** axillary, racemose, slender, simple or branched. **Flowers** regular. **Sepals** 5, united shortly at base; lobes unequal, oblong-ovate. **Petals** 5, elliptic-lanceolate to ovate, exceeding sepals at maturity, scale 2-lobed, half as large as limb. **Disc** a complete ring, flat, broad, glabrous. **Male flower**: stamens 9, glabrous. **Female flower**: staminodes 8, curved in bud, glabrous; ovary 2-lobed, 2-locular; style truncate, with 2 stigmatic grooves. **Fruit** subglobose, grooved.

Monotypic: *Haplocoelopsis africana* F.G.Davies, tropical east Africa and Angola. The Angolan material may represent a separate, closely related taxon.

Haplocoelum Radlk.

Exell & Mendonça: 86 (1954/1956); Exell: 530 (1966); Exell & Sousa: 36 (1973); Dowsett-Lemaire & White: 83 (1990); Davies & Verdcourt: 43 (1998); White *et al.*: 531 (2001); Coates Palgrave: 650 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lecaniodiscus Planch. ex Benth.

Bentham: 250 (1849); Exell & Mendonça: 86 (1954/1956); Exell: 530 (1966); Exell & Sousa: 35 (1973); Davies & Verdcourt: 39 (1998); White *et al.*: 533 (2001); Coates Palgrave: 650 (2002).

Trees or shrubs, dioecious, spuriously polygamous; bark light brown, dark grey or blue-grey; young branches tomentellous. **Leaves** paripinnate, petiolate; leaflets 3–7-jugate, entire. **Inflorescence** an axillary racemoid or paniculate thyrse, often borne in axils of fallen leaves. **Flowers** yellow. **Sepals** 5, free nearly to base. **Petals** 0. **Disc** lobed. **Stamens** 8–13; filaments glabrous; staminodes present in female flowers. **Ovary** 3-locular; locules 1-ovulate; style short, stigma 3-lobed; pistillode present in male flowers. **Fruit** a 1-locular (by abortion), slightly asymmetrically ellipsoid capsule, indehiscent or tardily and irregularly splitting from base. **Seed** completely surrounded by an arillode.

Species 3, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Lepisanthes Blume

Blume: 237 (1825); Leenhouts: 33 (1969); Davies & Verdcourt: 50 (1998); Coates Palgrave: 648 (2002).

Aphania Blume; Exell & Mendonça: 81 (1954/1956); Exell: 525 (1966); Exell & Sousa: 30 (1973); Dowsett-Lemaire & White: 83 (1990); White *et al.*: 525 (2001).

Monoecious evergreen trees. **Leaves** pinnate; leaflets in 1–3 pairs, opposite or alternate, entire, glabrous, lowermost leaflets often reduced and sometimes stipule-like. **Inflorescences** terminal and axillary, paniculate or simple. **Flowers** regular, greenish yellow. **Sepals** (4)5, free, unequal, strongly imbricate. **Petals** (0–4)5, ovate, clawed, fringed with small hairs. **Disc** pentagonal, lobed, convex. **Stamens** 5–7, hairy at base. **Ovary** 2(3)-locular and -lobed with 1 ovule per locule; style entire; ovary rudiment in male flowers a cushion of hairs. **Fruit** of 1(–3) indehiscent mericarps, developed ones ellipsoid, but 1 or 2 abortive at base. **Seeds** without aril.

Sthn trop. Afr. 1: *Lepisanthes senegalensis* (Poir.) Leenh., Angola, Malawi, Mozambique.

Macphersonia Blume

Blume: 156 (1847); Exell: 534 (1966); Exell & Sousa: 41 (1973); Davies & Verdcourt: 37 (1998); Coates Palgrave: 651 (2002).

Dioecious small trees or shrubs; branchlets pubescent and pilose. **Leaves** 2-paripinnate with 3–6 pairs of pinnae; leaflets 5–10(–15)-jugate, obliquely oblong, entire, nearly glabrous. **Inflorescence** an axillary racemoid thyrse. **Flowers** unisexual, regular. **Sepals** 5, petaloid, slightly connate at base. **Petals** 5, small, unguiculate, each with 2 linear scales at base formed by infolding of margin. **Disc** annular, glabrous. **Stamens** 7 or 8; filaments glabrous. **Ovary** (2)3-locular; locules 1-ovulate; pistillode very small in male flowers. **Fruit** baccate, usually 1- or 2-locular and 1- or 2- seeded (by abortion). **Seed** with a thin arillode.

Species ± 8 species in Madagascar and the Comoro Islands, and 1, *Macphersonia gracilis* O.Hoffm. (=*M. hildebrandtii* O.Hoffm.), extending to eastern trop. Africa; sthn trop. Afr.: Mozambique.

Majidea Kirk ex Oliv.

Oliver: t. 1097 (1871); Mendes: 105 (1970); Davies & Verdcourt: 17 (1998).

Monoecious tall trees with greyish bark; twigs, leaves and inflorescences initially densely fasciculate-hairy. **Leaves** with 5–9 pairs of leaflets; rachis 4-angled, with lines of simple hairs on angles; leaflets ovate to lanceolate, slightly asymmetric, entire, glabrescent. **Inflorescence** terminal, paniculate. **Flowers** regular, subtended by herbaceous bracts. **Sepals** 5, free, concave, herbaceous, externally hairy. **Petals** 4, without claw or scale. **Disc** a complete circle. **Stamens** 7 or 8(–10); filaments folded in bud, glabrous; anthers sagittate. **Ovary** 3-lobed, 3-locular with 2 ovules in each locule; style long, hairy with a glabrous, channelled tip. **Fruit** a dehiscent trigonous capsule, opening to reveal 3 bright pink valves. **Seeds** 1 or 2 per valve, ovoid, without aril, softly velvety, blue-black; cotyledons spirally arranged.

Species 2 or 3, trop. Africa and Madagascar; sthn trop. Afr. 1: *Majidea fosteri* (Sprague) Radlk., Angola.

Pancovia Willd.

Exell & Mendonça: 84 (1954/1956); Exell: 525 (1966); Exell & Sousa: 32 (1973); Davies & Verdcourt: 57 (1998); White *et al.*: 533 (2001); Coates Palgrave: 648 (2002); Mapaura & Timberlake: 169 (2002); Phiri (Unpublished).

Sthn trop. Afr. at least 1: *Pancovia golungensis* (Hiern) Exell & Mendonça,

but probably 2 or more, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pappea Eckl. & Zeyh.

Exell & Mendonça: 91 (1954/1956); Exell: 540 (1966); Exell & Sousa: 42 (1973); Fivaz & Robbertse: 342 (1993); Coates Palgrave: 651 (2002).

Monotypic genus: *Pappea capensis* Eckl. & Zeyh., widespread in tropical and southern Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Paullinia L.

Exell & Mendonça: 73 (1954/1956); Burtt Davy *et al.*: 93 (1958); Exell: 512 (1966); Exell & Sousa: 20 (1973); White *et al.*: 535 (2001).

Sthn trop. Afr. 1: *Paullinia pinnata* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Placodiscus Radlk.

Radlkofer: 332 (1878); Exell & Mendonça: 232 (1952); Exell & Mendonça: 85 (1954/1956); Fouilloy & Hallé: 126 (1973); Hall: 287 (1980); Davies & Verdcourt: 54 (1998).

Small trees or shrubs. **Leaves** paripinnate, 4–7-jugate, very large, usually crowded at ends of branches; leaflets petiolulate, oblong-elliptic, abruptly acute-acuminate, entire, glabrous. **Inflorescences** racemes, axillary or arising on old wood. **Flowers** regular; pedicels articulated near base. **Calyx** turbinate, tomentellous outside. **Sepals** 5, deltoid. **Petals** 0. **Disc** regular, cup-shaped or flat, smooth. **Stamens** 8 or 9; filaments twice geniculate in bud, pilose; anthers oblong, introrse, basi-dorsifixed. **Ovary** 3(4)-locular and 3(4)-lobed, with 1 ovule per locule; pistillode present in male flowers. **Fruit** indehiscent, 2- or 3(4)-lobed, turbinate, shortly stipitate; calyx and style ± persistent. **Seeds** flattened, without aril.

Species ± 15, mostly in W trop. Africa; sthn trop. Afr. 1: *Placodiscus resendeanus* Exell & Mendonça, Angola (Cabinda).

Radlkofera Gilg

Gilg: 300 (1897); Exell & Mendonça: 82 (1954/1956); Fouilloy & Hallé: 79 (1973).

Monoecious, single-stemmed trees with a somewhat palm-like appearance. **Leaves**: ± 25 arranged in a crown ± 3.5 m in diameter at apex of stem, pinnate, up to 2 x 0.5 m, 13–15-jugate; leaflets opposite to subopposite, ovate to oblong-lanceolate, long-acute to acuminate, entire. **Inflorescences** slender many-flowered racemes, ascending at least when young, arising in axils of lowest leaves and on upper half of leafless stem; female flowers fewer than male flowers and interspersed among them. **Flowers** regular, unisexual; buds globose, brownish. **Calyx** subglobose, scarcely opening by 5 short, obtuse lobes. **Petals** 4, rounded, with 2 superposed scales on inner face and a pubescent claw, pale yellow. **Disc** crescent-shaped, fleshy, faintly lobed, orange or red. **Stamens** 6–8, unequal, introrse; filaments slightly thicker towards base, with ascending brown hairs, at least in upper part; anthers dorsifixed. **Ovary** with 6(7) uni-ovulate locules alternating with stamens. **Fruit** subglobose to pear-shaped, baccate, up to 150 mm in diameter.

Monotypic genus: *Radlkofera calodendron* Gilg, tropical W Africa; sthn trop. Afr. Angola (Cabinda).

Stadmannia Lam.

Exell: 533 (1966) as *Stadmania*; Exell & Sousa: 38 (1973) as *Stadmania*; Davies & Verdcourt: 32 (1998) as *Stadmania*; Coates Palgrave: 652 (2002).

Sthn trop. Afr. 1: *Stadmannia oppositifolia* Poir. subsp. *rhodesica* Exell, Zimbabwe, and sthn Afr.

Zanha Hiern

Hiern: 128 (1896); Exell & Mendonça: 92 (1954/1956); White: 225 (1962); Exell: 537 (1966); Exell & Sousa: 39 (1973); Davies & Verdcourt: 14 (1998); White *et al.*: 535 (2001); Coates Palgrave: 657 (2002).

Dialiopsis Radlk.; Burtt Davy *et al.*: 93 (1958); White: 224 (1962).

Medium-sized dioecious trees; branchlets glabrous or tomentellous when young. **Leaves** paripinnate; leaflets 3–7-jugate, subsessile to shortly petiolulate, elliptic to oblong-elliptic, crenate, shallowly serrate or dentate or entire. **Inflorescence** a short to very short paniculate thyrse usually borne on a short shoot. **Flowers** unisexual, regular. **Sepals** 4 or 5(6). **Petals** 0. **Disc** small. **Stamens** (3)4–7, coiled in bud; staminodes of female flowers without anthers. **Ovary** 2-locular; locules 2-ovulate; style short; stigma 2-lobed; pistillode absent in male flowers. **Fruit** 1-locular (by abortion), ± drupaceous. **Seed** 1, pendulous from apex of locule; testa provided with stomata; arillode absent.

Species 4: 3 in trop. Africa, 1 in Madagascar; sthn trop Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

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Sapotaceae

(Dilleniidae—Sapotales)
(Asterids—Ericales)

Bredenkamp, C.L. in Leistner: 506 (2000). General family references: Arends: 449 (1976), Harley: 379 (1991).

Sthn trop. Afr.: genera 12, species 34.

Key to genera

[partly after Kupicha (1983)]

1a Calyx of 2 distinct whorls of sepals, either 3 + 3 or 4 + 4; petals often with conspicuous lateral appendages:
2a Calyx with 3 + 3 sepals; corolla of 6 deeply 3-lobed petals joined into a tube at the base; staminodes glabrous, standing away from the ovary; anthers relatively small (±1.5 mm long) ..... **Manilkara**
2b Calyx with 4 + 4 sepals; corolla of 8 deeply 3-lobed petals joined into a tube at the base; staminodes usually 8, pilose abaxially and on margins, and erect or loosely coherent into a cone round the ovary and the style; anthers relatively large (2.5 mm or longer):
3a Stipules large and conspicuous ..... **Baillonella**
3b Stipules absent or minute:
4a Leaves clustered at branch ends; seeds with large scar covering up to half the surface area; endosperm absent ..... **Vitellariopsis**
4b Leaves not clustered at branch ends; seeds with small basal scar, containing abundant endosperm ..... **Mimusops**
1b Calyx of 5 sepals arranged spirally or in 1 whorl:
5a Corolla of 5 deeply 3-lobed petals united into a basal tube ..... **Inhambanella**
5b Corolla of 5 unlobed petals united into a tube of varying length:
6a Stamens in fascicles of 2 or 3 opposite each corolla lobe:
7a Stamen fascicles fused at the base; flowers in fascicles on old wood ..... **Omphalocarpum**
7b Stamen fascicles of 2 or 3 stamens completely fused with each other; flowers solitary, axillary ..... **Tridesmostemon**
6b Stamens 1 opposite each corolla lobe:
8a Secondary veins of leaves inconspicuous, surface of lamina divided into small polygonal areoles by tertiary vein reticulation; seeds subspherical, faintly 5-ribbed with small basal scar ..... **Sideroxylon**
8b Secondary veins of leaves easily distinguished, lamina not clearly marked into small polygonal areoles; seeds ± compressed-ellipsoid with long lateral scar:
9a Fruit (1, 2)3–5-seeded; seeds laterally compressed; endosperm copious ..... **Chrysophyllum**
9b Fruit 1-seeded; seeds not much compressed; endosperm absent:
10a Lateral nerves of leaves closely spaced, straight and parallel, diverging at a wide angle from the midrib; lower leaf surface silvery or coppery sericeous with a dense indumentum of appressed hairs ..... **Englerophytum**
10b Leaves not as above, lateral nerves widely spaced and curving from midrib to margin, lamina not sericeous below:
11a Stipules present, at least on youngest leaves ..... Synsepalum
11b Stipules absent:
12a Sepals united in lower half, forming a woody, shallowly lobed cupule in fruit; leaves with inconspicuous tertiary nerves ..... Synsepalum
12b Sepals free almost to the base; leaves with conspicuous tertiary nerves ..... **Pouteria**

Baillonella Pierre

Pierre: 13 (1890); Aubréville: 51 (1961); Baehni: 120 (1965); Pennington: 126 (1991); Gautier: 26 (1997); Govaerts *et al.*: 34 (2001).

Unarmed trees. **Leaves** spirally arranged, clustered at shoot apex; venation brochidodromous, with parallel secondaries, tertiaries oblique. **Inflorescences** densely clustered at shoot apex in axils of small scale leaves. **Flowers** bisexual. **Calyx** of 2 whorls of 4 free sepals, outer whorl valvate. **Corolla** tube shorter than lobes, hairy; lobes 8, divided to base into 3 segments; median segment erect; lateral segments spreading, exceeding median segment, undivided. **Stamens** 8, in a single whorl arising at top of corolla tube; filaments free; anthers extrorse, glabrous; staminodes 8, alternating with stamens, erect, narrowly lanceolate, hairy. **Ovary** 8-locular, hairy; placentation basi-ventral; style slightly exserted. **Fruit** 1- or 2-seeded, indehiscent, fleshy. **Seed** broadly ellipsoid, with a thick, hard, shining testa; scar broad, covering adaxial surface of seed; embryo vertical, with thick, fleshy plano-convex cotyledons and exserted radicle; endosperm absent.

Monotypic genus: *Baillonella toxisperma* Pierre, W Africa; sthn trop. Afr.: Angola (Cabinda).

Chrysophyllum L.

Heine: 25 (1963); Hemsley: 7 (1968); Kupicha: 211 (1983); Pennington: 216 (1991); Gautier: 27 (1997); Govaerts *et al.*: 58, 341 (2001); White *et al.*: 538 (2001); Coates Palgrave: 875 (2002); Mapaura & Timberlake: 169 (2002).

Donella Pierre ex Baill.

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Englerophytum K.Krause

Krause: 343 (1914); Aubréville: 86 (1961); Liben: 151 (1989); Pennington: 250 (1991); Gautier: 28 (1997); Govaerts *et al.*: 94, 354 (2001); White *et al.*: 538 (2001); Coates Palgrave: 876 (2002).

Bequaertiodendron De Wild.: 22 (1919); Heine & Hemsley: 306 (1960); Aubréville: 252 (1961); Hemsley: 18 (1968). Kupicha: 222 (1983); Steyn & Robbertse: 440 (1990). *Boivinella* (Pierre ex Baill.) Aubrév. & Pellegr.: 37 (1958). *Pachystela* sect. *Zeyherella* (Pierre ex Engl.) Lecomte: 193 (1919). *Wildemaniodoxa* Aubrév. & Pellegr.: 251 (1961). *Zeyherella* (Pierre ex Baill.) Aubrév. & Pellegr.: 37 (1958).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Inhambanella (Engl.) Dubard

Hemsley: 45 (1968); Kupicha: 232 (1983); Pennington: 140 (1991); Gautier: 30 (1997); Govaerts: 104 (2001) (*I. henriquezii* sphalm.); Coates Palgrave: 884 (2002).

Species 2, trop. Africa; sthn trop. Afr. 1: *Inhambanella henriquesii* (Engl. & Warb.) Dubard, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Manilkara Adans.

Kupicha: 242 (1983); Pennington: 128 (1991); Gautier: 30 (1997); Govaerts *et al.*: 138 (2001); Greuter: 1215 (2001); White *et al.*: 542 (2001); Coates Palgrave: 880 (2002); Mapaura & Timberlake: 169 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mimusops L.

Hemsley: 50 (1968); Kupicha: 233 (1983); Pennington: 120 (1991); Gautier: 32 (1997); Govaerts *et al.*: 164 (2001); White *et al.*: 542 (2001); Coates Palgrave: 878 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Omphalocarpum P.Beauv.

Palisot de Beauvois: 146 (1800); Greves: 70 (1927); Pennington: 260 (1991); Aubréville: 75 (1961); Govaerts *et al.*: 185 (2001).

Trees; branches terete, striate. **Leaves** alternate, sessile, lanceolate, acuminate, base cuneate; stipules absent. **Flowers** bisexual or unisexual (dioecious), in fascicles on old wood or on branches, often subtended by spirally arranged bracts. **Calyx** a single whorl of 5 free, quincuncial sepals. **Corolla** broadly tubular; tube shorter than the 5 broadly ovate lobes. **Stamens** ± 20 in a single whorl, ± 3 opposite each corolla lobe and arising at top of corolla tube; filaments well-developed, glabrous; anthers extrorse, glabrous, absent in female flowers; staminodes 5 or more, much shorter than corolla lobes, usually petaloid, fimbriate, glabrous, often inflexed and covering ovary. **Disc** absent. **Ovary** many-locular; placentation axile; style usually included. **Fruit** usually depressed-globose; several- to many-seeded; outer pericarp often woody. **Seeds** strongly laterally compressed; testa smooth, shining; scar adaxial, nearly full-length, very narrow; embryo with thin foliaceous cotyledons and exserted radicle; endosperm copious.

Species ± 6, W and WC trop. Africa; sthn trop. Afr. 1: *Omphalocarpum mayumbense* Greves, Angola (Cabinda).

Pouteria Aubl.

Aublet: 85 (1775); Pennington: 184 (1991); Gautier: 34 (1997); Govaerts *et al.*: 221 (2001); White *et al.*: 543 (2001).

Aningeria Aubrév. & Pellegr.: 795 (1935); Hemsley: 26 (1968); Kupicha: 218 (1983); Coates Palgrave: 874 (2002). *Malacantha* Pierre; Greves: 73 (1929); Hemsley: 24 (1968); Kupicha: 220 (1983). *Sersalisia* R.Br.; Greves: 72 (1927).

Tall, deciduous, often dioecious trees, often with strongly buttressed or deeply fluted bole. **Leaves** usually spirally arranged, rarely opposite, chartaceous or coriaceous, ± clearly pellucid-punctate, densely pubescent to subglabrous; lateral nerves many-paired, looped distally and running parallel to leaf margin or extending to leaf edge to form the thickened margin, tertiary veins conspicuous; stipules 0. **Flowers** often unisexual, (4)5(6)-merous, sessile or shortly pedicellate, fasciculate in axils of current or fallen leaves. **Calyx** a single whorl of 4–6 sepals ± free to base, or 6–11 in a closely imbricate spiral. **Corolla**: tube slightly shorter to longer than lobes; lobes 4–6(–9), simple, sometimes fringed or papillose, usually erect. **Stamens** 4–6(–9), arising in lower or upper half of tube, rarely free; anthers usually extrorse or laterally dehiscent, included; staminodes, if present, usually as many as corolla lobes, small, ± subulate or rarely petaloid. **Disc** present or absent. **Ovary** 1–6(–16)-locular, subglobose, densely pilose; placentation

axile; style cylindrie, slightly expanded towards apex, included or exserted. **Fruit** a subglobose to narrowly ellipsoid 1–several-seeded berry. **Seed** solitary, ± ellipsoid; testa shining brown with conspicuous scar; endosperm present or absent; cotyledons fleshy.

Species ± 200, Old and New World tropics, Africa ± 5; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Sideroxylon L.

Burtt Davy *et al.*: 95 (1958); Helmsley: 33 (1968); Kupicha: 230 (1983); Pennington: 166 (1991); Gautier: 35 (1997); Govaerts *et al.*: 290, 354 (2001); Coates Palgrave: 871 (2002).

Sthn trop. Afr. 1: *Sideroxylon inerme* L., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Synsepalum (A.DC.) Daniell

Daniell: 445 (1852); Pennington: 242 (1991); Gautier: 35 (1997); Govaerts *et al.*: 316 (2001); White *et al.*: 543 (2001); Coates Palgrave: 872 (2002); Mapaura & Timberlake: 169 (2002).

Afrosersalisia A.Chev.; White: 320 (1962); Hemsley: 42 (1968); Kupicha: 215 (1983). *Pachystela* Pierre ex Radlk.; Hemsley: 35 (1968); Kupicha: 225 (1983); Govaerts *et al.*: 346 (2001). *Vincentella* Pierre; Hemsley: 39 (1968); Kupicha: 227 (1983).

Trees or shrubs. **Leaves** spirally arranged, ± coriaceous, lateral nerves fairly conspicuous, distant, curving towards leaf apex; stipules absent or present, persistent or caducous. **Flowers** bisexual, 5-merous, fascicled or solitary, long-pedicellate or sessile, borne in axils of current and fallen leaves, sometimes on branches, rarely on stem. **Calyx** a single whorl of 5(6) free or partly united sepals. **Corolla**: tube short; lobes 5(6), usually widely spreading, simple, longer to shorter than tube. **Stamens** 5(6), arising at level of base of corolla lobes, included in to considerably exserted from corolla; filaments free, long and slender or very short; anthers usually extrorse. **Staminodes** in a single whorl alternating with the stamens, sometimes absent. **Disc** absent. **Ovary** 5(–7)-locular, ovoid or narrowly conical, pilose; placentation axile; style slender, usually exserted. **Fruit** a 1-seeded berry. **Seed** ellipsoid, not laterally compressed, scar long, occupying lateral face; endosperm absent, cotyledons fleshy.

Species ± 20, trop. Africa; sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Tridesmostemon Engl.

Engler: 99 (1905); Aubréville: 82 (1961); Pennington: 261 (1991); Govaerts *et al.*: 324 (2001).

Sideroxylon in sense of Greves: 71 (1927).

Trees. **Leaves** spirally arranged; stipules absent. **Flowers** bisexual, solitary or in few-flowered fascicles, axillary or in axils of fallen leaves. **Calyx** a single whorl of 5 free imbricate sepals. **Corolla** cyathiform; lobes 5, free almost to base, simple, imbricate, spreading or reflexed at tip. **Stamens** 10–15, 2 or 3 opposite each corolla lobe, arising $^1/_3$–$^1/_2$-way up on corolla lobes; filaments of each pair or group of 3 fused almost to apex, hairy; anthers extrorse, hairy or glabrous; staminodes 5, usually 3-dentate at apex, hairy. **Disc** absent. **Ovary** 10-locular; placentation axile; style slightly exserted. **Fruit** subglobose, several-seeded. **Seed** strongly laterally compressed; testa smooth, shiny; scar adaxial, almost full length, very narrow; embryo with thin foliaceous cotyledons and exserted radicle; endosperm present.

Species 2, W trop. Africa; sthn trop. Afr. 1: *Tridesmostemon omphalocarpoides* Engl., Angola (Cabinda).

Vitellariopsis Baill. ex Dubard

Kupicha: 240 (1983); Pennington: 123 (1991); Gautier: 39 (1997); Govaerts *et al.*: 331 (2001); Coates Palgrave: 883 (2002); Mapaura & Timberlake: 176 (2002).

Species 6, E and sthn Africa; sthn trop. Afr. 2, Zimbabwe, Mozambique, and sthn Afr.

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Scrophulariaceae
(including Orobanchaceae)
(Asteridae—Scrophulariales)
(Euasterids I—Lamiales)

Smithies, S.J. in Leistner: 508 (2000).

It has recently been proposed to divide Scrophulariaceae into several families (Judd *et al.*, 2002; Angiosperm Phylogeny Group, 2003). One of these families, Orobanchaceae, has often in the past been considered to differ sufficiently to warrant family status. In its strictest circumscription it comprises some 220 species in about 15 genera of root-parasitic herbs with leaves reduced to scales; flowers in which the anterior corolla lobes cover the posterior lobes in bud; and a 1-locular ovary with parietal placentas (Mabberley 1997). Only two of the genera here dealt with fall in this group: *Cistanche* and**Orobanche*.

Young *et al.* (1999), Goldblatt & Manning (2000), and Olmstead *et al.* (2001) use as the defining morphological synapomorphy of Orobanchaceae the external anterior lobes in corolla aestivation. In the context of the present work and in the light of the present knowledge it is not considered useful to attempt to place all genera here dealt with into one of the several families which have been proposed.

Sthn trop. Afr.: genera 54, species 264.

Key to genera

[based mainly on Philcox (1990), Fischer (1999c) and Smithies (2000)]

1a Ovary with 1 ovule in each locule; fruit consisting of 2(1) ± ovoid cocci:
- 2a Two lateral corolla lobes ascending and united with 2 posterior (upper) lobes to form a 4-lobed upper lip; anterior (lower) lobe aborted or reduced to a small tooth ..... **Hebenstretia**
- 2b Corolla limb usually with a 1- or 2-lobed upper lip and 3-lobed lower lip, occasionally upper lip 4-lobed with 1 well-developed anterior lobe ..... **Selago**

1b Ovary with 2–many ovules in each locule; fruit a capsule, berry or drupe:
- 3a Plants holoparasitic, lacking chlorophyll, or apparently so because of other colouring masking green colour; leaves scale- or bract-like or aborted:
  - 4a Corolla tube bent abruptly above the middle, usually 2-lipped; anthers 1-thecate ..... **Striga**
  - 4b Corolla straight or somewhat curved but not abruptly bent above the middle, ± regular or 2-lipped; anthers 2-thecate, but sometimes thecae unequal and one may be subobsolete:
    - 5a Corolla distinctly 2-lipped; ovary 1-locular with parietal placentation; seeds subglobose ..... ***Orobanche**
    - 5b Corolla subregular to somewhat 2-lipped:
      - 6a Succulent root parasite; stem simple, often thickened at the base; ovary 1-locular ..... **Cistanche**
      - 6b Herbaceous to slightly succulent parasites; stem simple or branched; ovary 2-locular:
        - 7a Corolla yellow or orange with red or markedly darker veins; anther thecae equal or unequal, all fertile ..... **Alectra**
        - 7b Corolla variously coloured, if yellow, without darker veins; anther thecae unequal, one fertile, one barren or subobsolete ..... **Harveya**
- 3b Plants not apparently or actually holoparasitic; leaves with chlorophyll:
  - 8a Flowers spurred or markedly saccate, pouched or gibbous:
    - 9a Corolla tube pouched on anterior side:
      - 10a Annual herbs, glabrous or glandular-pilose ..... ***Misopates**
      - 10b Shrubs or small trees with stellate hairs on many parts ..... **Anastrabe**
    - 9b Flowers spurred at the base:
      - 11a Erect herbs or undershrubs ..... **Nemesia**
      - 11b Creeping or prostrate herbs ..... **Diclis**
  - 8b Flowers neither spurred, saccate nor gibbous:
    - 12a Leaves mostly alternate, upper leaves sometimes opposite, never all leaves radical:
      - 13a Stamens 2; staminodes absent ..... **Anticharis**
      - 13b Stamens 4, rarely 5:
        - 14a Leaves circular; small creeping herbs ..... **Sibthorpia**
        - 14b Leaves not circular; plants erect, prostrate or tufted:

15a Foetid shrubs; branches straight, rigid, subspinescent with age ..... **Antherothamnus**
15b Habit not as above:
16a Capsule thick-walled, ± globose, compressed in upper part at right angles to the septum; plants prostrate or decumbent subshrubs ..... **Aptosimum**
16b Capsules thin-walled, not compressed as above; plants erect:
17a Calyx campanulate, shortly 5-lobed; leaves scale-like, entire ..... **Micrargeriella**
17b Calyx 5-lobed nearly to base; leaves well-developed:
18a Corolla 4-lobed; tube constricted towards base, throat not bearded ..... ***Digitalis**
18b Corolla shortly 5-lobed; tube not constricted towards base, throat bearded or with a V-shaped band of clavate hairs inside:
19a Corolla tube scarcely expanded at apex; anterior anthers shortly exserted; seeds with 6–8 longitudinal ribs ..... **Camptoloma**
19b Corolla tube abruptly expanded at apex; usually no more than tips of anterior anthers visible in mouth of corolla; seeds not ribbed ..... **Jamesbrittenia**

12b Leaves opposite or at least subopposite with upper ones sometimes alternate, or leaves radical, fascicled or verticillate:
20a Stamens 2, with or without staminodes:
21a Leaves much divided; plant aquatic; staminodes 0; cleistogamous flowers with only 2 stamens; chasmogamous flowers with 4 stamens ..... **Limnophila**
21b Leaves not divided; plant terrestrial, creeping or erect:
22a Corolla tube short, limb subrotate; stamens exserted ..... **Veronica**
22b Corolla with distinct tube, usually 2-lipped; stamens included:
23a Staminodes present, with distinct appendages and long slender filaments ..... **Lindernia**
23b Staminodes reduced to 2 small protuberances or 0 ..... **Dopatrium**
20b Stamens 4, rarely 2 by abortion of anterior pair:
24a Trees, shrubs, distinctly woody undershrubs, or slender climbers:
25a Plant climbing ..... **Buttonia**
25b Plant not climbing:
26a Fruit baccate, indehiscent:
27a Tree or shrub; calyx 3–5-cleft; corolla tube 18–33 mm long ..... **Halleria**
27b Shrub or robust herb; calyx 5-partite; corolla tube up to 5 mm long ..... **Teedia**
26b Fruit capsular, dehiscent:
28a All 4 anthers clearly exserted from the corolla tube:
29a Subshrub with many rigid branchlets branching at almost right angles ..... **Hiernia**
29b Weakly woody perennial; branches not spreading horizontally ..... **Sutera**
28b Anthers ± included in corolla tube or only 1 pair of anthers exserted:
30a Anthers 2-thecate with thecae free, diverging:
31a Flowers in terminal or axillary cymes; leaves entire to toothed in upper half; capsule not compressed, with 2-fid valves ..... **Freylinia**
31b Flowers mostly solitary; leaves coarsely toothed throughout; capsule strongly longitudinally compressed, appearing broadly unilaterally winged ..... **Graderia**
30b Anthers 1-thecate by the fusion of 2 thecae:
32a Foetid shrubs; branches straight, rigid, subspinescent with age ..... **Antherothamnus**
32b Plants of different habit:
33a Posterior filaments continuing down the corolla tube in the form of raised lines, often to base, sometimes very briefly:
34a Corolla tube scarcely expanded at apex; anterior anthers shortly exserted; seeds with 6–8 longitudinal ribs ..... **Camptoloma**
34b Corolla tube abruptly expanded at apex, usually not more than tips of anterior anthers visible in mouth of corolla tube ..... **Jamesbrittenia**
33b Posterior filaments not continuing down the corolla tube in the form of raised lines:
35a Posterior stamens included, arising halfway up the tube or higher; anterior stamens either included or anthers just visible in mouth of corolla tube ..... **Manulea**
35b One or both pairs of stamens exserted at anthesis, arising near base of tube ..... **Sutera**
24b Herbs or herbaceous undershrubs:
36a Leaves all in a basal rosette:
37a Leaves petiolate to subsessile, glabrous to sparsely hairy; tufted marsh or aquatic herbs with or without stolons ..... **Limosella**
37b Leaves sessile to subsessile, pubescent to hirsute, at least on lower surface; small poikilohydrous perennials usually growing on shallow soil overlying rock ..... **Craterostigma**
36b Leaves not all radical; ± erect herbs or undershrubs, not aquatic:
38a Anthers 1-thecous, strictly or by confluence of the 2 thecae:
39a Anthers strictly 1-thecous:
40a Flowers solitary, axillary, pedicellate; lower pair of anthers with a 2-branched connective ..... **Pseudosopubia**

40b Flowers in spikes, racemes or clusters; anthers without a 2-branched connective:
41a Corolla tube rather sharply curved at or above the middle and often dilated at the curve; anthers basifixed .. **Striga**
41b Corolla tube straight or sometimes slightly curved; anthers dorsifixed:
42a Flowers small, sessile or subsessile, usually in spikes or globose clusters; corolla lobes subequal; ovary elliptic ..... **Buchnera**
42b Flowers large, usually petiolate and in racemes (rarely sessile and in spikes); corolla lobes unequal; ovary ovate, ovoid or globose:
43a Stamens didynamous, arising at 2 levels in the corolla tube; style never exceeding lower pair of stamens .... **Cycnium**
43b Stamens equal in length, arising at 1 level in the corolla tube; style exceeding the stamens ... **Rhamphicarpa**
39b Anthers 1-thecous by confluence:
44a Posterior filaments not continuing down the corolla tube in the form of raised lines:
45a Posterior stamens included, arising halfway up the tube or higher; anterior stamens either included or anthers just visible in mouth ..... **Manulea**
45b One or both pairs of stamens exserted at anthesis, arising near base of tube ..... **Sutera**
44b Posterior filaments continuing down the corolla tube in the form of raised lines, often to base, sometimes very briefly:
46a Stigma very short (up to 2 mm), often minutely bifid, stigmatic surface ± terminal:
47a Corolla tube scarcely expanded at apex; anterior anthers shortly exserted; seeds with 6–8 longitudinal ribs, testa reticulate in furrows between ribs ..... **Camptoloma**
47b Corolla tube abruptly expanded at apex; usually no more than tips of anterior anthers visible in mouth of corolla; seeds not ribbed, testa reticulate ..... **Jamesbrittenia**
46b Stigma tongue-shaped (tip occasionally minutely bifid), often ± equalling or longer than the style, flattened, with 2 marginal bands of stigmatic papillae:
48a Bract either adnate to pedicel (or part of pedicel) only, or to pedicel and base of calyx tube (never more than lower third):
49a Capsule beaked; orange patches, if present on corolla limb, located on all lobes, forming a radial pattern .... **Zaluzianskya**
49b Capsule not beaked; orange/yellow patches present on corolla limb but only on posterior lip .... **Melanospermum**
48b Bract adnate at least halfway up the calyx tube, rarely less:
50a Calyx strongly 5-ribbed; corolla tube much longer than calyx ..... **Zaluzianskya**
50b Calyx not strongly ribbed; corolla tube ± as long as calyx or slightly longer ..... **Polycarena**
38b Anthers with 2 fertile thecae, or 1 theca fertile, the other sterile and often variously modified:
51a Anthers with 2 equal or subequal fertile thecae:
52a Stamens and staminodes, if present, arising at top or in throat of corolla tube, anterior ones often with appendages at base and a knee-like bend:
53a Plants with a basal rosette of leaves, or with a very short, densely leafy stem ..... **Craterostigma**
53b Plants not with a basal rosette of leaves; stem ± elongated:
54a Plants up to 1 m high; leaves usually longer than 100 mm; flowers 20–30 mm long; anterior stamens with 2 basal appendages ..... **Artanema**
54b Plants distinctly smaller; leaves no longer than 50 mm; flowers smaller than above; anterior stamens with 1 basal appendix:
55a Leaves pinnately veined; seeds with round pits:
56a Calyx with winged sepals; ovary with a distinct asymmetric hairy disc; capsule at first poricidal, later septicidal ..... **Torenia**
56b Calyx not winged; disc very small or absent, glabrous; capsule septicidal ..... **Lindernia**
55b Leaves palmately veined; seeds smooth or with longitudinal grooves:
57a Lower lip of corolla with many-celled club-shaped hairs at the base; seeds with longitudinal grooves; endosperm pitted ..... **Crepidorhopalon**
57b Lower lip of corolla with glandular or 1-celled hairs; seeds smooth ..... **Lindernia**
52b Stamens and staminodes, if present, arising in corolla tube; anterior pair without or with appendages:
58a Calyx large, campanulate, shortly 5-toothed, 10-ribbed, inflated in fruit ..... **Melasma**
58b Calyx not becoming inflated in fruit:
59a Calyx deeply and markedly unequally lobed ..... **Bacopa**
59b Calyx not markedly unequally lobed, but sometimes ± 2-lipped:
60a Corolla 4-lobed, regular, rotate; calyx deeply 4- or 5-lobed ..... ***Scoparia**
60b Corolla 5-lobed; tube funnel-shaped or campanulate; calyx 5-toothed or 5-lobed:
61a Anther thecae separate, usually on short stalks:
62a Plant aquatic or amphibious, glabrous to subglabrous ..... **Limnophila**
62b Plant terrestrial, strongly glandular-pubescent, viscid, foetid; capsule globose ..... **Stemodia**
61b Anther thecae distinct, in contact with each other but often widely diverging:
63a Flowers distinctly pedicellate:

64a Capsule shortly beaked and reflexed at maturity ..... **Stemodiopsis**
64b Capsule neither beaked nor reflexed:
65a Capsule strongly longitudinally flattened, appearing unilaterally winged, included in persistent calyx ..... **Graderia**
65b Capsule neither strongly flattened nor winged:
66a Bracts and bracteoles absent:
67a Pedicels 10–20 mm long; corolla clearly 2-lipped; plant drying green ..... **Mimulus**
67b Pedicels up to 5 mm long; corolla subrotate but not truly 2-lipped; plant drying blackish ..... **Hedbergia**
66b Bracts and/or bracteoles present:
68a Only bracts present; pedicels 4–14 mm long ..... **Gerardiina**
68b Both bracts and bracteoles present; pedicels 2–4 mm long; plant drying blackish glabrous to subglabrous ..... **Micrargeria**
63b Flowers sessile or apparently so:
69a Bracteoles absent; corolla neither thin nor conspicuously veined, not marcescent; seeds winged ..... **Hedbergia**
69b Bracteoles present:
70a Corolla yellow or cream; plant hemiparasitic, drying black; stems rather stout; leaves often toothed, sometimes reduced to scales ..... **Alectra**
70b Corolla pinkish white to purple; plant not parasitic; stems very slender, almost filiform; leaves narrowly linear ..... **Micrargeria**
51b Anthers with 1 fertile theca and 1 modified sterile theca or appendage:
71a Plant climbing ..... **Buttonia**
71b Plant not climbing:
72a Plant hemiparasitic, drying black and with scale-like leaves or only a few small green leaves ..... **Harveya**
72b Plants not hemiparasitic, not drying black; leaves not scale-like, green:
73a Anthers free, not cohering; annual with deeply pinnatifid leaves with 3–7 linear lobes ..... **Baumia**
73b Anthers all coherent or coherent in pairs; annuals or perennials with entire to pinnatifid leaves ..... **Sopubia**

Alectra Thunb.

Good & Exell: 119 (1929/1930); Melchior: 423 (1941); Philcox: 269 (1987); Philcox: 85 (1990); Mielcarek: 85 (1996).

Melasma P.J.Bergius in part; Hiern: 767 (1898); Good & Exell: 118 (1929).

Sthn trop. Afr. 21, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anastrabe E.Mey. ex Benth.

Smithies: 514 (2000); Coates Palgrave: 1003 (2002).

Monotypic genus: *Anastrabe integerrima* E.Mey. ex Benth., sthn trop. Afr.: Mozambique, and sthn Afr.

Antherothamnus N.E.Br.

Philcox: 20 (1990); Hilliard: 75 (1994).

Monotypic genus: *Antherothamnus pearsonii* N.E.Br.; sthn trop. Afr.: Zimbabwe, and sthn Afr.

Anticharis Endl.

Good & Exell: 117 (1929/1930); Philcox: 7 (1990).

Sthn trop. Afr. 1: *Anticharis senegalensis* (Walp.) Bhandari, Angola, Zimbabwe, and sthn Afr.

Aptosimum Burch. ex Benth.

Hiern: 755 (1898); Hemsley & Skan: 267 (1906); Good & Exell: 116 (1929/1930); Philcox: 3 (1990); Fischer: 199 (1999c).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Artanema D.Don

Don: t. 234 (1834) name conserved; Good & Exell: 117 (1929/1930); Hepper: 361 (1963); Fischer: 192 (1999c).

Erect perennial herbs with simple or sparsely branched, glabrous, quadrangular stems. **Leaves** opposite, shortly petiolate, ovate to lanceolate, acuminate at apex, serrulate except cuneate base, scabrid above, penninerved. **Inflorescence** a lax raceme with a pair of flowers at each floriferous node. **Flowers** 2-lipped, reddish purple with paler throat. **Calyx** glabrous, 5-lobed; lobes ovate to lanceolate. **Corolla** slightly irregular; upper lip 2-lobed, with glandular hairs inside; lower lip 3-lobed; tube gradually widening, much longer than lobes. **Stamens** 4; filaments of anterior stamens geniculate and incurved, papillate and with glandular hairs, filaments of posterior stamens ± straight, much shorter; anthers with 2 equal thecae. **Ovary** globose, glabrous; style filiform; stigma 2-lobed. **Fruit** a septicidal capsule. **Seeds** with alveolate endosperm.

Species 4, Old World tropics; sthn trop. Afr. 1: *Artanema longifolium* (L.) Vatke, Angola.

Bacopa Aubl.

Philcox: 48 (1990); Greuter *et al.*: 270 (2000); Mielcarek: 33 (1996); Fischer: 26 (1999c).

Moniera P.Browne; Good & Exell: 117 (1929/1930).
Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Baumia Engl. & Gilg

Engler & Gilg: 365 (1903); Hemsley & Skan: 456 (1906); Good & Exell:

123 (1929/1930).

Erect, slender, hispid annual herbs; stem simple or slightly branched above middle. **Leaves** opposite, sessile, deeply pinnatifid with 3–7 linear, costate, usually entire lobes. **Flowers** solitary in axils of upper leaves and in short terminal spikes; bracteoles 2, lanceolate, ± as long as calyx. **Calyx** campanulate, slightly constricted at top, 10-ribbed, coarsely hairy outside, glabrous within; lobes 5, nearly equal, short, triangular. **Corolla**: tube cylindric, widening slightly upwards, ± as long as calyx; lobes 5, ± equal, rounded, reflexed. **Stamens** 4, ± equal, very shortly exserted; filaments filiform; anthers free, glabrous, one theca perfect, opening longitudinally, the other much reduced, club-shaped. **Ovary** 2-locular, glabrous; ovules many; style filiform, glabrous, thickened towards tip, curving downwards with line of hairs on underside of curve. **Capsule** orbicular, compressed, enclosed in calyx.

Monotypic genus: *Baumia angolensis* Engl. & Gilg, known only from Angola. Differs from *Sopubia* mainly in the free, not coherent, anthers.

Buchnera L.

Hiern: 755 (1898); Good & Exell: 119 (1929/1930); Philcox: 269 (1987); Philcox: 96 (1990); Philcox: 241 (1991); Mielcarek: 96 (1996); Bingham & Smith: 144 (2002); Mapaura & Timberlake: 169 (2002).

Sthn trop. Afr. 53, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Buttonia McKen ex Benth.

Philcox: 141 (1990).

Sthn trop. Afr. 1: *Buttonia natalensis* McKen ex Benth., Zimbabwe, Mozambique, and sthn Afr.

Camptoloma Benth.

Hilliard: 80 (1994).

Sthn trop. Afr. 1: *Camptoloma rotundifolium* Benth., Angola, and sthn Afr. (N Namibia).

Cistanche Hoffmanns. & Link

Hoffmannsegg & Link: 318 (1813); Hepper: 374 (1963); Philcox: 158 (1990).

Root parasites totally lacking chlorophyll, fleshy; stems succulent, simple, often thickened at base. **Leaves** reduced to fleshy scales. **Inflorescence** congested, spicate. **Flowers** simple or subsessile, bracteate, bibracteolate, rather large. **Calyx** gamosepalous, 4- or 5-lobed, persistent; lobes obtuse, rounded, equal or 2 posterior ones narrower. **Corolla** tubular below, funnel- shaped above, ± curved or bent; limb 5-lobed, spreading, lobes broad, equal or subequal. **Stamens** 4, didynamous, ± exserted, arising deep in corolla tube; anthers usually bearded. **Stigma** globular; style apically decurved. **Ovary** unilocular, ovules many; style apically decurved; stigma globular. **Capsule** bi-valved. **Seeds** many, minute.

A genus of 16 species, southern Mediterranean Europe and north Africa; Ethiopia to India and northwest China; sthn trop. Afr. 1: *Cistanche tubulosa* (Schenk) Hook.f., Mozambique.

Craterostigma Hochst.

Hiern: 761 (1898); Hepper: 271 (1987); Fischer: 439 (1989a); Hepper: 53 (1990); Fischer: 85 (1992); Fischer: 76 (1999c).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Crepidorhopalon Eb.Fisch.

Fischer: 443 (1989a); Fischer: 445 (1989b); Fischer: 126 (1992); Fischer: 371 (1999b); Fischer: 84 (1999c); Bingham & Smith: 144 (2002).

Craterostigma Hochst., partly; Hepper: 53 (1990). *Lindernia* All., partly; Philcox: 61 (1990). *Torenia* L., partly; Hepper: 271 (1987); Philcox: 56 (1990).

Species 29, Africa and Madagascar; sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cycnium E.Mey. ex Benth. emend. Engl.

Hiern: 777 (1898); Hansen: 23 (1978); Philcox: 137 (1990); Mielcarek: 163 (1996).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Diclis Benth.

Hiern: 756 (1898); Philcox: 12 (1990); Mielcarek: 67 (1996); Fischer: 22 (1999c).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Digitalis** L.

Linnaeus: 621 (1753); Philcox: 77 (1990).

Biennial or perennial herbs or rarely small shrubs. **Leaves** alternate or sometimes predominantly basal, simple, variously dentate to subentire. **Flowers** irregular, in terminal, bracteate, racemes. **Calyx** 5-lobed; lobes equal to subequal, shorter than corolla tube. **Corolla** tubular, cylindrical or inflated-globose, usually constricted towards base; limb usually bilabiate with lips spreading or erect, upper lip shorter. **Stamens** 4. **Capsule** conical to ovoid, septicidal. **Seeds** small, many.

Species ± 20, Europe, Mediterranean and Canary Islands; naturalised elsewhere in the world, as an escape from cultivation; sthn trop. Afr. 1: **Digitalis purpurea* L. recorded from Zimbabwe and Malawi.

Dopatrium Buch.-Ham. ex Benth.

Philcox: 51 (1990); Mielcarek: 46 (1996); Fischer: 527 (1997a); Fischer: 38 (1999c).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Freylinia Colla

Philcox: 20 (1990); Coates Palgrave: 1002 (2002).

Sthn trop. Afr. 1: *Freylinia tropica* S.Moore, Zimbabwe, Mozambique, and sthn Afr.

Gerardiina Engl.

Hiern: 770 (1898); Philcox: 154 (1990); Mielcarek: 81 (1996).

Sthn trop. Afr. 1: *Gerardiina angolensis* Engl., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Graderia Benth.

Hiern: 772 (1898); Philcox: 149 (1990).

Bopusia Presl; Hiern: 772 (1898).

Sthn trop. Afr. 1: *Graderia scabra* (L.f.) Benth., Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Halleria L.

White: 377 (1962); Philcox: 16 (1990); Mielcarek: 30 (1996); Fischer: 21 (1999c); White *et al.*: 549 (2001); Coates Palgrave: 1001 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Harveya Hook.

Hiern: 780 (1898); Hemsley & Skan: 435 (1906); Philcox: 93 (1990); Mielcarek: 220 (1996).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hebenstretia L.

Hiern: 825 (1900) under Selagineae; Hilliard: 315(1990); Philcox: 161 (1990); Mielcarek: 68 (1996); Fischer: 16 (1999c); Hilliard: 1 (1999); Mapaura & Timberlake: 169 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hedbergia Molau

Molau: 194 (1988); Philcox: 156 (1990); Mielcarek: 231 (1996).

Perennial herbs, sometimes shrubby, erect to scrambling, branched below, becoming tufted, pubescent. **Leaves** opposite, sessile, crenate or serrate, decreasing in size above. **Flowers** solitary, axillary, shortly pedicellate, ebracteolate. **Calyx** 4-lobed; lobes straight. **Corolla** subrotate, 5-lobed; limb weakly bilabiate but not separated into galea and lip. **Stamens** 4, didynamous; anther thecae 2, equal, parallel, mucronate. **Style** simple, filiform; stigma entire. **Capsule** ovoid. **Seeds** many, white, longitudinally winged.

Monotypic genus: *Hedbergia abyssinica* (Hochst. ex Benth.) Molau, trop. Africa; sthn trop. Afr.: Zambia, Malawi. Molau described this genus as distinct from *Bartsia* L. by reason of its 5-lobed, subrotate not markedly bilabiate and galeate corolla.

Hiernia S.Moore

Hiern: 806 (1900) under Acanthaceae; Engler & Gilg: 363 (1903); Merxmüller & Rössler: 24 (1967).

Monotypic genus: *Hiernia angolensis* S.Moore; sthn trop. Afr.: Angola, and sthn Afr.

Jamesbrittenia Kuntze

Hilliard: 225 (1992); Hilliard: 84 (1994); Mapaura & Timberlake: 169 (2002). *Sutera* Roth, partly; Philcox: 26 (1990).

Sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Limnophila R.Br.

Good & Exell: 117 (1929/1930); Philcox: 43 (1990); Mielcarek: 50 (1996); Fischer: 48 (1999c).

Stemodiacra P.Browne; Hiern: 758 (1898).

Sthn trop. Afr. 8, Angola, Zambia, Malawi, Mozambique, and sthn Afr.

Limosella L.

Hiern: 766 (1898); Philcox: 73 (1990); Mielcarek: 64 (1996); Fischer: 60 (1999c).

Sthn trop. Afr. 2, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lindernia All.

Hiern: 763 (1898); Philcox: 268 (1987); Fischer: 439 (1989a); Fischer: 445 (1989b); Philcox: 61 (1990); Fischer: 214 (1992); Seine *et al.*: 7 (1995); Fischer: 361 (1999a); Fischer: 138 (1999c).

Ilysanthes Raf.; Good & Exell: 118 (1929/1930). *Torenia* L., partly; Mapaura & Timberlake: 182 (2002).

Sthn trop. Afr. 21, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Manulea L.

Philcox: 34 (1990); Greuter *et al.*: 325 (2000); Hilliard: 291 (1994).

Nemia P.J.Bergius; Hiern: 757 (1898).

Sthn trop. Afr. 1: *Manulea parviflora* Benth., Angola, Zimbabwe, Mozambique, and sthn Afr.

Melanospermum Hilliard

Hilliard: 387 (1994); Smithies: 526 (2000).

Sthn trop. Afr. 1: *Melanospermum foliosum* (Benth.) Hilliard, Zimbabwe, and sthn Afr.

Melasma P.J.Bergius

Hiern: 767 (1898); Good & Exell: 118 (1929/1930); Philcox: 82 (1990). Mielcarek: 77 (1996).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Micrargeria Benth.

Candolle: 509 (1846); Hiern: 770 (1898); Philcox: 151 (1990); Mielcarek: 94 (1996).

Annual, rigid, erect, branched herbs. **Leaves** opposite to alternate, linear, entire or trifid. **Flowers** small, solitary-axillary or terminally racemose, bi-bracteolate. **Calyx** campanulate, 5-lobed; lobes ovate to lanceolate, acute or obtuse. **Corolla** limb subequally 5-lobed; lobes entire; tube enlarged above, sometimes incurved. **Stamens** 4, somewhat didynamous, included; anthers free, bithecal; thecae arched or parallel, distinct, apically attached. **Ovary** 2–4-locular; ovules many. **Capsule** globose to subglobose. **Seeds** many, obovoid.

Species 5, tropical west, east and southern Africa with 1 in India; sthn trop. Afr. 1: *Micrargeria filiformis* (Schumach. & Thonn.) Hutch. & Dalz., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Micrargeriella R.E.Fr.

Fries: 290 (1916); Philcox: 154 (1990); Mielcarek: 95 (1996); Bingham & Smith: 144 (2002).

Perennial, erect herb; stems simple or sparsely branched. **Leaves** alternate, scale-like, entire. **Flowers** medium-sized, terminally racemose, pedicellate, bi-bracteolate. **Calyx** campanulate, shortly 5-lobed. **Corolla** 5-lobed; lobes broad, entire, subequal, erect, spreading, tube enlarged above, somewhat incurved. **Stamens** 4, didynamous, included, glabrous; anthers free, thecae apically attached, becoming divergent at anthesis. **Ovary** bilocular; ovules many.

Monotypic genus: *Micrargeriella aphylla* R.E.Fr., presently known only from Zambia.

Mimulus L.

Hiern: 758 (1898); Good & Exell: 117 (1929/1930); Philcox: 36 (1990); Mielcarek: 62 (1996); Fischer: 74 (1999c).

Sthn trop. Afr. 1: *Mimulus gracilis* R.Br., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Misopates** Raf.

Philcox: 14 (1990).

Sthn trop. Afr. 1: **Misopates orontium* (L.) Raf., naturalised in Malawi, and a weed in sthn Afr.

Nemesia Vent.

Philcox: 9 (1990).

Sthn trop. Afr. 2, Zimbabwe, Mozambique, and sthn Afr.

***Orobanche** L.

Hepper: 374 (1963); Philcox: 161 (1990); Kreutz: 120 (1995); Mielcarek: 233 (1996); Phiri (Unpublished).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Polycarena Benth.

Philcox: 23 (1990).

Sthn trop. Afr. 1: *Polycarena transvaalensis* Hiern, Zimbabwe, and sthn Afr.

Pseudosopubia Engl.

Engler: 28 (1897); Hemsley & Skan: 440 (1906); Brummitt (Unpublished).

Herbs or subshrubs. **Leaves** opposite or nearly so, sessile to shortly petiolate, entire. **Flowers** solitary, axillary, pedicellate. **Calyx** campanulate, 5-lobed; lobes ± equal. **Corolla**: tube suddenly inflated above base; limb oblique, 2-lipped; lobes 5, rounded. **Stamens** 4, didynamous, included, dimorphic, all arising nearly on same level; upper pair smaller, with appendage; lower pair with a 2-branched connective: upper branch shorter, curved upwards and terminating in a disc-shaped appendage; anthers all 1-thecous and dehiscing by a terminal pore. **Ovary** 2-locular; ovules many. **Capsule** ovoid, 2-valved. **Seeds** many, rather large, angular, oblique, deeply pitted.

Species 7, trop. Africa; presence in sthn trop. Afr. is uncertain, but given as Angola by Brummitt (Unpublished).

Rhamphicarpa Benth. emend. Engl.

Hiern: 778 (1898); Hansen: 103 (1976); Philcox: 135 (1990); Mielcarek: 172 (1996).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Scoparia** L.

Hiern: 766 (1898); Good & Exell: 118 (1929/1930); Philcox: 77 (1990); Mielcarek: 32 (1996); Fischer: 34 (1999c).

Sthn trop. Afr. 1: **Scoparia dulcis* L., a pantropical weed originally from the New World, recorded from Angola, Zambia, Malawi, Mozambique, and sthn Afr.

Selago L.

Hiern: 826 (1900) under Selagineae; Philcox: 170 (1990); Hilliard: 1 (1994); Fischer: 17 (1999c); Hilliard: 1 (1999); Mapaura & Timberlake: 169 (2002).

Walafrida E.Mey.; Mielcarek: 121 (1988); Philcox: 165 (1990); Mielcarek: 71 (1996); Phiri (Unpublished).

Sthn trop. Afr. 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sibthorpia L.

Linnaeus: 631 (1753); Linnaeus: 279 (1754); Hiern: 766 (1898); Philcox: 75 (1990); Mielcarek: 228 (1996); Fischer: 208 (1999c).

Perennial, small, creeping herbs; stems rooting at nodes. **Leaves** alternate, petiolate, suborbicular-reniform, crenate to incised. **Flowers** axillary, 4- to 8-merous, solitary or fasciculate, pedicellate. **Pedicels** ebracteate. **Calyx** 4–8-lobed; lobes somewhat unequal. **Corolla** rotate; tube short; lobes equalling calyx in number or one more, entire, subequal, spreading. **Stamens** 4–8, equalling corolla lobes or one or two less; filaments short, filiform, subequal; anthers sagittate; thecae contiguous at apex. **Style** short; stigma capitate. **Capsule** somewhat compressed, loculicidal. **Seeds** few, oblong-ovoid, reticulate or smooth.

Species 5, Western Europe, Azores, Balearic Islands, America and trop. Africa; sthn trop. Afr. 1: *Sibthorpia europaea* L., Zambia, Zimbabwe.

Sopubia Buch.-Ham. ex D.Don

Hiern: 772 (1898); Philcox: 143 (1990); Mielcarek: 199 (1996).

Sthn trop. Afr. 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stemodia L.

Linnaeus: 1091, 1118 (1759); Philcox: 38 (1990); Mielcarek: 42 (1996); Fischer: 64 (1999c).

Annual, glandular-pubescent, much-branched, often aromatic herbs, or subshrubs. **Leaves** opposite or verticillate, occasionally alternate below, simple, subentire to variously toothed. **Flowers** irregular, in lax terminal racemes or solitary-axillary, pedicellate. **Pedicels** uni- or bibracteolate. **Calyx** 5-lobed; lobes narrow, equal or subequal. **Corolla** tubular; tube cylindric; upper lip broad, emarginate to entire; lower lip trilobed. **Stamens** 4, didynamous, included; filaments slender; anther

thecae stipitate, all fertile. **Style** usually bilobed. **Capsule** globose, ovoid, sometimes acuminate, valves 2, bifid or 4; usually loculicidally dehiscent. **Seeds** many, small, striate.

Species ± 30, tropics of both Old and New World; sthn trop Afr. 1: *Stemodia serrata* Benth., Zambia, Mozambique.

Stemodiopsis Engl.

Philcox: 40 (1990); Mielcarek: 43 (1996); Fischer: 305 (1997b); Fischer: 68 (1999c); Bingham & Smith: 144 (2002); Mapaura & Timberlake: 182 (2002).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Striga Lour.

Hiern: 778 (1898); Good & Exell: 120, 121 (1929/1930); Hepper: 127 (1990); Mielcarek: 174 (1996); Mohamed *et al.*: 60 (2001).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sutera Roth

Philcox: 26 (1990); Hilliard: 345 (1991); Hilliard: 220 (1994).

Sthn trop. Afr. 3, Zimbabwe, and sthn Afr.

Teedia Rudolphi

Dahlgren & Rao: 458 (1971); Philcox: 18 (1990).

Sthn trop. Afr. 1: *Teedia lucida* (Sol.) Rudolphi, Zimbabwe, and sthn Afr.

Torenia L.

Hiern: 762 (1898); Good & Exell: 117 (1929/1930); Philcox: 267 (1987); Fischer: 439 (1989a); Philcox: 56 (1990) partly; Fischer: 332 (1992).

Sthn trop. Afr. 1: *Torenia thouarsii* (Cham. & Schltdl.) Kuntze, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Veronica L.

Philcox: 80 (1990); Mielcarek: 224 (1996); Fischer: 200 (1999c).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, and sthn Afr.

Zaluzianskya F.W.Schmidt

Hilliard: 349 (1990); Philcox: 23 (1990); Hilliard: 460 (1994).

Sthn trop. Afr. 3, Zimbabwe, Mozambique, and sthn Afr.

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Scytopetalaceae

(Dilleniidae—Theales)
(Asterids—Ericales; under Lecythidaceae)

Tall, glabrous trees; young branches weakly angular. **Leaves** alternate, distichous, simple, ± symmetric, entire but undulate; petiole very short, flattened above; stipules minute, early caducous (Breteler 2002). **Inflorescences** terminal or subterminal, axillary racemes. **Flowers** bisexual, regular. **Calyx** cupular with truncate or toothed margin. **Petals** (corolla probably represents a corona, presumably of staminodial origin) 12–16, valvate and connate in bud and opening irregularly in 6 or 7 lobes free or joined at base, often falling as 1 piece. **Stamens** ± 50, arising centrifugally on or around disc, essentially epipetalous, often falling with corolla; anthers 2-thecous, basifixed, opening by longitudinal slits. **Ovary** superior, 4–8-locular, with 2 apical-axile, pendulous, anatropous, bitegmic ovules per locule; style 1; stigma entire. **Fruit** a ± ovoid drupe with mesocarp (not endocarp) lignified. **Seeds** usually 1, with embryo embedded in deeply ruminate endosperm.

Genera 5, species 20, tropical W Africa; sthn trop. Afr. genus 1, species 1.

Engler: 242 (1897); Exell & Mendonça: 399 (1951); Keay: 299 (1958); Letouzey: 106 (1960); Germain: 320 (1963); Verdcourt: 1 (1968); Letouzey: 139 (1978); Appel: 207 (1996); Mabberley: 653 (1997); Breteler: 759 (2002).

Scytopetalum Pierre ex Engl.

Engler: 244 (1897); Exell & Mendonça: 347 (1951); Letouzey: 116 (1960); Germain: 326 (1963); Letouzey: 186 (1978).

Description as for family.

Species 3, tropical W Africa; sthn trop. Afr. 1: *Scytopetalum klaineanum* Pierre ex Engl., Angola (Cabinda).

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Simaroubaceae

(Rosidae—Sapindales)
(Eurosids II—Sapindales)

Trees or shrubs, erect or sometimes scandent, sometimes spiny, usually containing bitter substances; pubescence usually simple, sometimes glandular. **Leaves** alternate, pinnate or rarely simple, without gland dots; stipules spiny (*Harrisonia*) or 0. **Inflorescences** paniculate, racemose or cymose, terminal and axillary. **Flowers** regular, unisexual, sometimes with rudiments of opposite sex, or bisexual, small. **Sepals** (3)4 or 5(6), nearly always partly united, valvate to slightly imbricate. **Petals** (3)4 or 5(6), usually free, imbricate or valvate. **Stamens** 4–10, arising at base of disc, free; filaments sometimes with an appendage at base; anthers 2-thecous, with longitudinal slits. **Disc** annular, cushion- or cup-shaped. **Ovary** superior, (2–)4 or 5(–7)-locular and -lobed or carpels free; ovules 1(2) per locule/carpel, apical or basal, anatropous or hemitropous, bitegmic; styles (2–)4–8, variously connate or free. **Fruit** a berry or composed of drupaceous or dry mericarps. **Seeds** with little or no endosperm.

Genera 13, species ± 110, widely distributed in the tropics and subtropics, with main centres in tropical America and tropical west Africa; sthn trop. Afr.: genera 3, species 7. *Kirkia* Oliv. and *Suriana* L., formerly usually included in Simaroubaceae, are here dealt with under Kirkiaceae and Surianaceae respectively.

Candolle: 422 (1811) name conserved; Exell & Mendonça: 395 (1951); Wild & Phipps: 210 (1963); Wild *et al.*: 1 (1969); Fernando & Quinn: 177 (1995); Stannard: 1 (2000).

Key to genera

1a Plants armed; fruit a globose or lobed berry ..... **Harrisonia**
1b Plants unarmed; fruit of separate drupaceous mericarps:
2a Stamens 4 or 5, without hairy appendages at base; leaves not crowded at tips of branches ..... **Brucea**
2b Stamens 10, with hairy appendages at base; leaves usually crowded towards tips of branches ..... **Quassia**

Brucea J.F.Mill.

Miller: t. 25 (1779/1780) name conserved; Wild & Phipps: 212 (1963); Stannard: 6 (2000); White *et al.*: 550 (2001).

Shrubs or small trees; at least younger parts ± ferrugineous-pubescent or tomentose. **Leaves** often ± crowded towards ends of branches, usually imparipinnate; leaflets opposite, in 3–5 pairs, entire to shallowly repand, base asymmetric. **Inflorescence** axillary, spiciform or in spiciform panicles, polygamous. **Flowers** usually in distant small glomerules. **Sepals** 4 or 5, united towards base, imbricate. **Petals** 4 or 5, free, imbricate. **Stamens** 4 or 5, arising beneath and between lobes of disc, reduced in female flowers. **Disc** fleshy, (3)4(5)-lobed. **Gynoecium** of 4 or 5 carpels, free or joined at base, each with 1 pendulous ovule; absent or vestigial in male flowers; styles 4 or 5, free. **Fruit** of drupaceous mericarps developing from 1–4 carpels of each flower. **Seed** 1 per mericarp.

Species 8, Old World tropics; sthn trop. Afr. 1: *Brucea antidysenterica* J.F.Mill., Angola, Zambia, Malawi.

Harrisonia R.Br. ex A.Juss.

Jussieu: 517 (1825), name conserved; Exell & Mendonça: 279 (1951); Wild & Phipps: 218 (1963); Wild *et al.*: 5 (1969); Stannard: 1 (2000); White *et al.*: 550 (2001); Coates Palgrave: 422 (2002).

Erect or sometimes scandent shrubs or small trees; bark of trunk and larger branches corky, pale brown, often with conical corky bosses surmounted, at least at first, by a prickle; smaller branches ± prickly or unarmed, pubescent to ± glabrous. **Leaves** not crowded at ends of branches, usually imparipinnate; leaflets opposite, in 2–7 pairs, usually asymmetric, margins crenate-serrate to crenate, sometimes entire; petioles and rachis winged. **Inflorescences** paniculate, axillary or terminal. **Sepals** 4 or 5(6), united at base. **Petals** 4 or 5(6), much longer than sepals, valvate, pubescent to glabrous outside. **Stamens** 8–10; filaments with a hairy appendage at base. **Disc** annular. **Ovary** 4- or 5-locular, globose or 4- or 5-lobed, with 1 pendulous ovule per locule; styles completely fused; stigma capitate, 4- or 5-lobed. **Fruit** a 4- or 5(6)-lobed, depressed-globose berry with 4 or 5(6) seeds.

Species 3 or 4, in trop. Africa, SE Asia and tropical Australia; sthn trop. Afr. 1: *Harrisonia abyssinica* Oliv., Angola, Zambia, Malawi, Mozambique.

Quassia L.

Linnaeus: 553 (1762); Exell & Mendonça: 278 (1951); Nooteboom: 514 (1962); Stannard: 10 (2000).

Hannoa Planch.: 566 (1846); Exell & Mendonça: 277 (1951); White: 172 (1962); Wild & Phipps: 216 (1963). *Mannia* Hook.f.; Exell: 54 (1927). *Pierreodendron* Engl.; Exell & Mendonça: 278 (1951).

Trees or shrubs; branchlets glabrous. **Leaves** imparipinnate,

2–5(–8)-jugate; not crowded at tips of branches; leaflets ± opposite, usually with pitted glands in upper (and sometimes in lower) surface; petiole and rachis not winged. **Flowers** in terminal and axillary thyrses. **Calyx** 2–5-lobed, or often bud rupturing irregularly to give a variable number of lobes. **Petals** 5, imbricate, puberulous. **Stamens** 10, 5 antepetalous ones somewhat shorter; filaments with hairy appendage at base. **Disc** annular to subcylindric, sometimes partially enveloping ovary, with furrows on outside accommodating stamens. **Gynoecium** of 5 carpels free, except for cohering styles, each carpel containing 1 ovule; styles very short, connate; stigmas 5. **Fruits** of 1–3(4) drupaceous mericarps. **Seeds** 1 per mericarp.

Species 35–40, pantropical; sthn trop. Afr. 5, Angola, Zambia.

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Solanaceae

(Asteridae—Solanales)
(Euasterids I—Solanales)

Welman, W.G. in Leistner: 537 (2000).

Sthn trop. Afr.: genera 9, species ± 60. Note: Species of **Capsicum* L., and **Cyphomandra* Mart. ex Sendtn., both of American origin, may occur as adventives.

Classification of Solanaceae

[adapted from D'Arcy (1991) and Hunziker (1979)]

I. Subfamily Solanoideae (seeds flattened; embryo circinnate or curved)
  1. Tribe Solaneae (filaments arising at base of anthers; aestivation valvate, induplicate or plicate, never conduplicate-contorted): **Capsicum*, **Physalis*, *Solanum*, *Withania*
  2. Tribe Datureae (filaments arising at or near base of anthers; aestivation conduplicate-contorted): **Datura*
  3. Tribe Lycieae (filaments arising on back of anthers): *Lycium*

II. Subfamily Cestroideae (seeds prismatic, reniform or subglobose, never flattened; embryo straight or bent, but then with incumbent or oblique cotyledons)
  1. Tribe Cestreae (fruit a berry; shrubs or trees; pedicels articulated): **Cestrum*
  2. Tribe Nicotianeae (fruit a capsule; herbaceous plants; pedicels not articulated): **Nicotiana*

Key to genera

1a Calyx becoming enlarged, bladdery and enclosing the fruit:
  2a Calyx lobes with wings down the back ..... ***Nicandra**
  2b Calyx lobes not winged:
    3a Flowers fascicled ..... **Withania**
    3b Flowers solitary ..... ***Physalis**
1b Calyx not inflated:
  4a Fruit a capsule:
    5a Capsule armed with spikes; annual herbs ..... ***Datura**
    5b Capsule unarmed; evergreen shrubs or small trees ..... ***Nicotiana**
  4b Fruit a berry:
    6a Flowers mostly solitary; leaves shorter than 50 mm, often in fascicles ..... **Lycium**
    6b Flowers in inflorescences; leaves mostly longer than 50 mm, rarely in fascicles:
      7a Flowers with a short tube and spreading lobes, or bell-shaped, in extra-axillary cymes or terminal panicles; anthers large, opening mostly by apical pores ..... **Solanum**
      7b Flowers trumpet- or urn-shaped, in axillary or terminal, cymose, paniculate or fascicled inflorescences; anthers small, opening by longitudinal slits:
        8a Flowers trumpet-shaped, longer than 10 mm ..... ***Cestrum**
        8b Flowers urn-shaped, usually shorter than 10 mm ..... **Discopodium**

*Cestrum L.

Hiern: 754 (1898); Coates Palgrave: 1000 (2002).

Sthn trop. Afr. 4, Angola and elsewhere in the region; introduced from Central America; also naturalised in sthn Afr.

*Datura L.

Hiern: 753 (1898); Wright: 256 (1906); Heine: 325 (1963); Binns: 98 (1968); Mapaura (Unpublished).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.; several species, of American origin, have become widely naturalised.

Discopodium Hochst.

Hochstetter: 22 (1844); Wright: 253 (1906); Heine: 328 (1963); D'Arcy: 23 (1976); White *et al.*: 552 (2001).

Small trees or shrubs. **Leaves** petiolate, entire, elliptic to oblong-elliptic, broadly acuminate, cuneate at base, glabrous or slightly pubescent on midrib. **Flowers** small, in axillary fascicles; pedicels longer than flowers. **Calyx** ± half as long as corolla, with 5 spreading, broadly triangular lobes, scarcely accrescent. **Corolla** cylindric, tomentellous outside above calyx; lobes 5, half as long as tube, ± reflexed or spreading. **Stamens** included, arising above middle of corolla tube; filaments short, filiform; anthers opening by longitudinal slits. **Style** short, included. **Fruit** a globose berry 6–8 mm in diameter.

Species 1–3; monotypic according to D'Arcy (1976); *Discopodium penninervium* Hochst., Malawi.

Lycium L.

Wright: 253 (1906); Venter: 107 (2000); Coates Palgrave: 995 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Nicandra Adans.

Binns: 98 (1968); Mapaura (Unpublished); Phiri (Unpublished).

Pentagonia Fabr.; Hiern: 752 (1898).

Sthn trop. Afr. 1: **Nicandra physaloides* (L.) Gaertn., Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

*Nicotiana L.

Coates Palgrave: 1001 2002); Mapaura (Unpublished).

Sthn trop. Afr. 1: **Nicotiana glauca* R.J.D.Graham, naturalised in Angola, Zimbabwe, Mozambique, and sthn Afr.

*Physalis L.

Hiern: 750 (1898); Wright: 246 (1906); Heine: 329 (1963); Binns: 98 (1968); Zhang & Lu (1999).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.; several species of American origin have become widely naturalised, including the cultivated **Physalis peruviana* L.

Solanum L.

Hiern: 745 (1998); Exell: 115 (1929); White: 376 (1962); Heine: 330 (1963); Binns: 98 (1968); Jaeger: 1 (1985); Jaeger & Hepper: 41 (1986); Gonçalves: 69 (1993); Gonçalves: 85 (1996); Gonçalves: 703 (1997); White *et al.*: 552 (2001); Coates Palgrave: 999 (2002); Mapaura (Unpublished).

Sthn trop. Afr. ± 40 (a tentative approximation representing a mixture of indigenous and naturalised species), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Withania Pauquy

White: 377 (1962); Hepper: 211 (1991); Nicoletti: 251 (2000); Mapaura (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 1: *Withania somnifera* (L.) Dunal, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and in sthn Afr.

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Sphenocleaceae
(Asteridae—Asterales)
(Euasterids I—Solanales)

Welman, W.G. in Leistner: 539 (2000).

Sthn trop. Afr.: genus 1, species 1.

Sphenoclea Gaertn.

Thulin: 2 (1973); Thulin: 116 (1983); Welman: 31 (2000); Mapaura (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 1: *Sphenoclea zeylanica* Gaertn., ?Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Strychnaceae
(formerly usually included in Loganiaceae)
(Asteridae—Gentianales)
(Euasterids I—Gentianales)

Victor, J.E. in Leistner: 543 (2000).

Sthn trop. Afr.: genera 2, species 26.

Identification of additional genus: **Usteria** can be immediately distinguished by its calyx which consists of a very short tube with 3 very small triangular and 1 very large narrowly oblong sepal.

Strychnos L.

Good & Exell: 102 (1929); White: 340 (1962); Leeuwenberg: 353 (1983); White *et al.*: 342 (2001); Coates Palgrave: 923 (2002); Mapaura & Timberlake: 165 (2002). In all these references the genus is placed under Loganiaceae.

Sthn trop. Afr. 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Usteria Willd.

Willdenow: 1 (1790); Baker: 517 (1903); Good & Exell: 102 (1929); Onochie & Leeuwenberg: 46 (1963); Leeuwenberg & Bamps: 141 (1979). In all these references the genus is placed under Loganiaceae.

Climbing shrubs or lianes with long internodes and smooth glabrous branchlets. **Leaves** opposite, equal in each pair, simple, petiolate, broadly elliptic, subacute to rounded at apex, entire, with 3 or 4 pairs of conspicuous lateral nerves, glabrous. **Inflorescence** a lax, multiflowered terminal panicle, minutely puberulous. **Flowers** bisexual. **Calyx**: tube very short; lobes 4: 3 very small, 1 large and foliaceous. **Corolla** trumpet-shaped; tube long, cylindric; lobes 4, subequal, ovate, acute, valvate. **Stamen** 1, exserted, arising near throat of corolla tube; filament glabrous; anther elliptic, with 2 separate thecae, glabrous. **Ovary** superior, globose, 2-locular with many ovules on an axile placenta; style filiform, exserted; stigma very small. **Fruit** a coriaceous, narrowly ovoid, septicidally 2-valved, apiculate capsule marked with 2 dehiscence lines. **Seeds** ellipsoid, surrounded by a very broad wing; endosperm sparse, fleshy; embryo straight.

Monotypic genus: *Usteria guineensis* Willd., W and C trop. Africa; sthn trop. Afr.: Angola.

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Surianaceae
(Rosidae—Rosales)
(Eurosids I—Fabales)

Maritime shrubs, much branched and spreading; stems grey-green, tomentellous and with glandular hairs when young, with conspicuous leaf scars when older. **Leaves** alternate, crowded, simple, upright, oblanceolate, thick, margins entire and revolute, venation ± invisible; petiole short to 0. **Flowers** bisexual, regular, in few-flowered cymes hardly longer than leaves, or solitary; bracts similar to leaves. **Calyx** deeply 5-lobed; lobes imbricate, persistent. **Petals** 5, free, imbricate. **Stamens** 10, in 2 whorls; filaments densely pilose towards base, alternate filaments somewhat shorter, and sometimes 5 filaments without anthers; anthers 2-thecous, rounded, dorsifix, with longitudinal slits. **Ovary** superior, of 5 free, densely pilose, 2-ovulate carpels; ovules collateral, basal and ascending; styles free, lateral. **Fruiting carpels** dry, 1-seeded, capable of floating. **Seeds** without endosperm; embryo conduplicate.

Genera 4, species 5, pantropical and in warm regions, 3 endemic in Australia; sthn trop. Afr. genus 1, species 1.

Arnott: 360 (1834); Wild & Phipps: 210 (1963) under Simaroubaceae; Mabberley: 692 (1997); Takhtajan: 311 (1997); Beentje: 1 (1998).

Suriana L.

Linnaeus: 284 (1753); Wild & Phipps: 210 (1963); Wild *et al.*: 1 (1969) (under Simaroubaceae); Beentje: 1 (1998).

Description as for family.

Monotypic genus: *Suriana maritima* L., pantropical; in Africa confined to east coast; sthn trop. Afr.: Mozambique.

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Tamaricaceae
(Dilleniidae—Violales)
(Core Eudicots—Caryophyllales)

Bredenkamp, C.L. in Leistner: 544 (2000).

Sthn trop. Afr.: genus 1, species 1.

Tamarix L.

Exell & Mendonça: 117, 369 (1937/1951); Obermeyer: 36 (1976); Baum: 19 (1978); Coates Palgrave: 740 (2002).

Species 54, Eurasia and Africa; sthn trop. Afr. 1: *Tamarix usneoides* E.Mey. ex Bunge (=*T. angolensis* Nied.), Angola, and sthn Afr.

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Theaceae
(Dilleniidae—Theales)
(Asterids—Ericales)

Trees, usually evergreen. **Leaves** alternate, simple, entire or serrulate, subcoriaceous; stipules 0. **Flowers** bisexual or sometimes unisexual, regular, axillary, solitary or sometimes paired or in fascicles, often with 1 or more pairs of bracteoles below calyx. **Sepals** 5(6), free to connate in lower third, imbricate, usually persistent. **Petals** 5(6), free or slightly joined, imbricate, opposite or alternating with sepals. **Stamens** many, in 1 or more whorls or in bundles of 3 stamens each opposite sepals and adnate to corolla at base; anthers 2-thecous, basifixed, opening lengthwise, sometimes at first by oblique apical pores; connec-

tive sometimes produced into an apiculus. **Ovary** superior, 2(3)- or falsely 4- or 6-locular, usually with 2 axile, anatropous, bitegmic ovules per locule; styles 5 or 6, free with papillose stigmas, or united with a 2-lobed stigma. **Fruit** a loculicidal capsule (often leaving a persistent central column), or indehiscent. **Seeds** 1 to many per locule; endosperm scanty to 0; embryo straight to curved.

Genera 22, species 610, mostly tropical and subtropical, some in temperate regions; sthn trop. Afr.: genera 2, species 3.

Don: 224 (1825); Melchior: 109 (1925); Exell: 30 (1927) under Ternstroemiaceae; Exell & Mendonça: 131, 387 (1937/1951); Robson: 405 (1961); Verdcourt: 1 (1962).

Key to genera

Leaves toothed; flowers in solitary or paired dichasia, with short pubescent peduncles; fruit a many-seeded, 5(6)-valved capsule ..... **Ficalhoa**
Leaves entire with inrolled margins; flowers solitary on long glabrous peduncles; fruit ± indehiscent with few seeds ..... **Ternstroemia**

Ficalhoa Hiern

Hiern: 329 (1898); Robson: 405 (1961); Verdcourt: 6 (1962); White *et al.*: 563 (2001).

Trees with terete branches. **Leaves** with serrulate margins. **Flowers** bisexual, small, in solitary or paired dichasia; peduncle short, pubescent. **Petals** alternating with sepals, quincuncial, connate in lower third to form a suburceolate corolla, eventually deciduous. **Stamens** in 5 bundles of 3 stamens each opposite sepals and adnate to corolla at base; connective not produced. **Ovary** 5(6)-locular, obtusely 5(6)-lobed, subhemispherical; ovules minute, many per locule on a central spongy placenta; styles 5(6), free almost to base to connate almost halfway, diverging. **Fruit** a 5(6)-valved, loculicidal capsule, hemispherical, woody. **Seeds** many, small, irregularly compressed-ovoid with loosely reticulate testa; endosperm scanty; embryo straight.

Monotypic: *Ficalhoa laurifolia* Hiern, trop. Africa; sthn trop. Afr., Angola, Zambia, Malawi. Originally placed in Ericaceae.

Ternstroemia Mutis ex L.f.

Linnaeus (filius): 39 (1782 '1781'); Melchior: 140 (1925); Exell & Mendonça: 131 (1937/1951); Exell: 142 (1970); Hepper: 429 (1968); Verdcourt: 1 (1962); White *et al.*: 563 (2001).

Adinandrella Exell: 30 (1927); Martins: 63 (1994).

Evergreen trees. **Leaves** with entire, inrolled margins. **Flowers** sometimes unisexual through reduction, solitary, on long glabrous peduncles. **Petals** opposite sepals or irregularly disposed. **Stamens** in 2 whorls, ± aggregated into clusters, ± free; connective produced into an apiculus. **Ovary** 2(3)-locular or falsely 4–6-locular; style simple, with capitate, faintly bilobed stigma. **Fruit** indehiscent or opening irregularly from top, ovoid, abruptly acuminate at apex. **Seeds** few, ellipsoid, with thick testa; endosperm usually reduced; embryo curved horseshoe-like, oil-rich.

Species 85, tropics, 2 in Africa; sthn trop. Afr. 2, Angola, Malawi. Formerly sometimes placed in Ternstroemiaceae.

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Thymelaeaceae

(Dilleniidae—Euphorbiales)
(Eurosids II—Malvales)

Bredenkamp, C.L. & Beyers, J.B.P. in Leistner: 544 (2000).

Sthn trop. Afr.: genera 8, species ± 34.

Key to genera (and 1 species)

[after Peterson (1978)]

1a Stamens as many as calyx lobes ..... **Struthiola**
1b Stamens twice as many as calyx lobes:
2a Calyx tube articulated above the ovary ..... **Gnidia**
2b Calyx tube not articulated above the ovary:

3a Petals present:
4a Flowers in terminal heads ..... **Gnidia glauca**
4b Flowers solitary, in terminal cymes or axillary:
5a Petals well-developed, much longer to shorter than the calyx lobes ..... **Dicranolepis**
5b Petals small, glandular:
6a Petals forming an entire or lobed, often ciliate ring ..... **Synaptolepis**
6b Petals represented by 10 minute glands ..... **Craterosiphon**
3b Petals absent:
7a Flowers axillary; calyx tube funnel-shaped ..... **Craterosiphon**
7b Flowers terminal; calyx tube cylindric, subcylindric or flask-shaped:
8a Flowers in racemes or umbels; ovary 2-locular ..... **Peddiea**
8b Flowers in heads or spikes; ovary 1-locular:
9a Flowers 5-merous, in pedunculate, bracteate heads; disc present; shrubs or small tree with expanded glossy leaves ..... **Dais**
9b Flowers 4(5)-merous, in spikes or heads; disc absent; mostly shrublets, often with ericoid leaves ..... **Passerina**

Craterosiphon Engl. & Gilg

Engler & Gilg: 233 (1894); Staner: 334, 370 (1935); White: 270 (1962); Mendes: 106 (1970); Monteiro: 155 (1970); Robyns: 20 (1975); Lebrun & Stork: 376 (2003); Phiri (Unpublished).

Erect shrubs, lianes or small trees; young branches red-brown with prominent corky lenticels. **Leaves** opposite or alternate, petiolate, coriaceous, ovate to narrowly elliptie to lanceolate, glabrous, margin recurved. **Flowers** bisexual, in 3(4)-flowered, almost sessile axillary clusters; pedicels slender. **Calyx**: receptacle tube funnel-shaped, not contracted above ovary; calyx lobes 5 or 6, ovate-oblong. **Petals** minute, scale-like, arising at throat of receptacle between filaments. **Stamens** twice as many as sepals, alternately long and short, in a single series at mouth of receptacle tube; filaments slender, decurrent down receptacle tube; anthers oblong. **Disc** cup-shaped, lobed. **Ovary** 1-locular, sessile; style filiform; stigma capitate. **Fruit** drupaceous with sclerified pericarp, inside persistent receptacle tube. **Seed** without endosperm; cotyledons thick.

Species 9, trop. Africa; sthn trop. Afr. 2, Angola, Zambia.

Dais L.

Peterson: 631 (1958b); Peterson: 16 (1978); Zavada & Lowrey: 11 (1995); White *et al.*: 566 (2001); Coates Palgrave: 780 (2002); Mapaura (Unpublished).

Sthn trop. Afr. 1: *Dais cotinifolia* L., Zimbabwe, Malawi, and sthn Afr.

Dicranolepis Planch.

Planchon: t. 798 (1848); Pearson: 238 (1910); Moore: 117 (1919); Gossweiler & Mendonça: 57, 90 (1939); Aymonin: 64 (1966).

Shrubs or small trees. **Leaves** alternate, 2-ranked, shortly petiolate, obliquely ovate, caudate-acuminate. **Flowers** bisexual, usually solitary in axils of leaves, ± sessile; receptacle tube slender, dilated at base. **Sepals** 5, oblanceolate-oblong, spreading or reflexed, pubescent on both surfaces. **Petals** opposite calyx lobes, and ± as long as these, entire or variously divided. **Stamens** 10, in 2 whorls in throat of receptacle tube, ± exserted. **Disc** cup-shaped. **Ovary** shortly pedunculate, 1-locular; style slender; stigma capitate. **Fruit** drupaceous, surrounded by persistent, ± fleshy base of receptacle tube. **Seeds** without endosperm; testa thin, ± fused with pericarp; cotyledons large.

Species 15, trop. Africa; sthn trop. Afr. ?2: *Dicranolepis angolensis* S.Moore (perhaps synonymous with *D. baertsiana* De Wild. & T.Durand), and *D. grandiflora* Engl., Angola.

Gnidia L.

Pearson: 216 (1910); Moore: 114 (1919); Staner: 340 (1935); Gossweiler & Mendonça: 162, 165 (1939); Peterson: 624 (1958b); Peterson: 208 (1959); White: 270 (1962); Binns: 99 (1968); Peterson: 18 (1978); Edwards *et al.*: 201 (2001); White *et al.*: 566 (2001); Lebrun & Stork: 378 (2003).

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Sthn trop. Afr. 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Passerina L.

Peterson: 630 (1958b); Peterson: 214 (1959); Bredenkamp & Van Wyk: 29 (2002); Coates Palgrave: 777 (2002); Mapaura (Unpublished).

Sthn trop. Afr. 2: *Passerina montana* Thoday and *P. montivagus* Bredenkamp & A.E.van Wyk, Zimbabwe, Mozambique, and sthn Afr.

Peddiea Harv.

Staner: 334 (1935); Burtt Davy *et al.*: 98 (1958); Peterson: 623 (1958b); White: 272 (1962); Glen: t. 1930 (1986); Breteler: 205 (1994); White *et al.*: 569 (2001); Coates Palgrave: 775 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Struthiola L.

Peterson: 319 (1958a); Peterson: 629 (1958b); Peterson: 215 (1959); Peterson: 144 (1964); Mapaura & Timberlake: 177 (2002); Mapaura (Unpublished).

Sthn trop. Afr. 2, Zimbabwe, Mozambique and sthn Afr.

Synaptolepis Oliv.

Oliver: t. 59 (1870); Pearson: 245 (1910); Burtt Davy *et al.*: 98 (1958); Peterson: 215 (1959); Peterson: 5 (1978).

Small shrubs or woody climbers; branches slender, often twining; bark lenticellate. **Leaves** alternate or opposite, petiolate, ovate to elliptic-lanceolate, membranous to coriaceous, glabrous, lateral nerves parallel, spreading, prominent beneath, margin thickened. **Inflorescences**: terminal cymes or axillary. **Flowers** 5-merous, solitary or fascicled in leaf axils, bracteate; pedicel sometimes glandular. **Calyx**: tube cylindric, glabrous.

Petals forming an erect, entire or lobed, often ciliate ring at base of calyx lobes. **Stamens** 10, in 2 whorls in upper part of calyx tube, episepalous whorl usually slightly exserted. **Disc** minute, ± deeply lobed. **Ovary** 1-locular, shortly stipitate; style slender; stigma capitate, papillate. **Fruit** dry, ovoid, enclosed in persistent base of calyx tube. **Seeds** without endosperm; embryo with fleshy cotyledons.

Species 5, trop. Africa and 1 in Madagascar; sthn trop. Afr. 3, Zimbabwe, Malawi, Mozambique.

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Trapaceae
(Rosidae—Myrtales)
(Rosids—Myrtales; under Lythraceae)

Bredenkamp, C.L. in Leistner: 548 (2000).

Sthn trop. Afr.: genus 1, species 1.

Trapa L.

Wild: 30 (1961); Fernandes & Fernandes: 203 (1970); Brenan: 346 (1978); Brenan & Fernandes: 2 (1986); Verdcourt: 11 (1998).

Species 1, polymorphic: *Trapa natans* L., Old World; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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*Tropaeolaceae
(Rosidae—Capparidales)
(Eurosids II—Brassicales)

Herbs, annual, perhaps sometimes biennial, slightly succulent, mostly glabrous, trailing. **Leaves** alternate, simple, peltate,

lamina circular, very slightly lobed; stipules only present in seedlings. **Flowers** bisexual, irregular, solitary, axillary, showy, on long pedicels. **Calyx** 5-lobed, unequal, dorsal one extended into a long nectariferous spur. **Petals** 5, free, heteromorphic, clawed. **Stamens** 4 + 4; anthers 2-thecous, opening by longitudinal slits. **Ovary** superior, 3-locular, with 1 pendulous, apical-axile, anatropous, bitegmic ovule per locule; style simple, divided at apex into 3 stigmatic lobes. **Fruit** dividing into 3, 1-seeded, fleshy mericarps. **Seeds** elongate; endosperm ± 0; embryo straight.

Genera 3, species 89, Central and S America; sthn trop. Afr. 1, species 1.

Candolle: 683 (1824); Farenholtz: 67 (1931); Marais: 1 (1987); Sparre & Andersson: 1 (1991); Mabberley: 730 (1997).

*Tropaeolum L.

Linnaeus: 345 (1753); Exell & Mendonça: 261 (1951); Marais: 1 (1987); Sparre & Andersson: 1 (1991); Ronse Decraene & Smets: 879 (2001).

Description as for family.

Sthn trop. Afr. 1: *_Tropaeolum majus_ L. is reported from Angola, but it is doubtful whether it is naturalised there. Sparre & Andersson (1991) state that 'there is no wild population known of *T. majus*', and they speculate that the species is the result of spontaneous hybridisation between **T. minus* L. and **T. ferreyrae* Sparre. It is reported as being subspontaneous on some of the Mascarenes and the Canary Islands.

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Turneraceae
(Dilleniidae—Violales)
(Eurosids I—Malpighiales)

Bredenkamp, C.L. in Leistner: 548 (2000).

Sthn trop. Afr.: genera 6, species 18.

Key to genera

[mainly after Fernandes (1978)]

1a Flowers mostly solitary, axillary:
- 2a Annual herbs; flowers small (up to 4.5 mm long), nearly concealed in axils of leaves; leaves crowded at ends of branches ..... **Hyalocalyx**
- 2b Shrublets, perennial herbs or shrubs; flowers larger, not as above; leaves scattered along the branches:
  - 3a Shrublets or perennial herbs rarely taller than 1 m; petals ± 12 mm long, yellow ..... **Piriqueta**
  - 3b Shrubs up to 2 m tall with slender ± erect branches; petals ± 25 mm long, yellow in upper part, dark red-brown below forming a conspicuous "eye" ..... **Turnera**

1b Flowers in racemes or panicles:
- 4a Shrubs or much branched undershrubs; capsule 1-seeded; seed straight, longitudinally striate-sulcate, submuricate ..... **Stapfiella**
- 4b Annual or perennial herbs; capsule many-seeded; seeds straight or curved, regularly reticulate-alveolate:
  - 5a Capsule linear (not less than 3.5 times as long as wide), usually constricted between the seeds; seeds straight; petals with a basal ligule ..... **Tricliceras**
  - 5b Capsule ellipsoid, not constricted between the seeds; seeds curved; petals without a ligule ..... **Streptopetalum**

Hyalocalyx Rolfe

Rolfe: 257 (1884); Fernandes: 353 (1978); Fernandes: 5 (1980).

Annual herbs covered with long, ± appressed yellowish hairs; stem erect, usually much branched from base. **Leaves** elliptic to elliptic-lanceolate, petiolate; stipules 0. **Flowers** solitary in axils of upper, very closely arranged leaves, heterostylous. **Sepals** hyaline-membranous, connate in lower half. **Petals** and stamens adnate to base of calyx tube, falling off with calyx and stamens after pollination. **Stamens**: filaments linear, flattened below; anthers cordate-ovate. **Ovary** ovoid, with 3 parietal placentas; styles 3, filiform, straight, with laciniate-flabellate stigmas. **Capsule** 3-valved, opening loculicidally from apex. **Seeds** oblong-obovoid, curved, with rigid, reticulate-alveolate testa; aril entire; albumen abundant, oily.

Monotypic genus from Madagascar, SE and E Africa: *Hyalocalyx setifer* Rolfe; sthn trop. Afr.: Mozambique.

Piriqueta Aubl.

Obermeyer: 98 (1976); Fernandes: 349 (1978); Fernandes: 2 (1980); Fernandez: 1 (1987).

Sthn trop. Afr. 1: *Piriqueta capensis* (Harv.) Urb., Zimbabwe, Mozambique, and sthn Afr.

Stapfiella Gilg

Gilg: 571 (1913); Lewis: 4 (1954); Fernandes: 351 (1978); Bingham & Smith: 148 (2002).

Much branched undershrubs or shrubs; young branches densely leafy, with yellowish, antrorse hairs. **Leaves** petiolate, usually elliptic and serrate at margin, frequently glandular-punctate; stipules 0. **Flowers** in terminal and axillary panicles or racemes. **Calyx** connate below middle, with 5 tubercles within. **Petals** arising at mouth of calyx tube, eligulate, white, whitish or nearly translucent. **Stamens**: filaments filiform, arising at mouth of calyx tube. **Ovary** 1-locular, 1-ovulate; ovule basal; stigmas fringed. **Capsule** ellipsoid or clavate, shortly rostrate, dehiscing septicidally into 3 valves from apex downwards. **Seed** obovoid, straight, longitudinally striate-reticulate.

Species 5, trop. Africa; sthn trop. Afr. 1: *Stapfiella zambesiensis* R.Fern., Zambia.

Streptopetalum Hochst.

Fernandes: 365 (1978); Bingham & Smith: 144 (2002).

Sthn trop. Afr. 3, Zambia, Zimbabwe, and sthn Afr.

Tricliceras Thonn. ex DC.

Fernandes: 355 (1978); Fernandes: 6 (1980); Izidine & Bandeira: 52 (2002).

Wormskioldia Thonn., Robyns: 7 (1967); Fernandes & Fernandes: 209 (1970).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Turnera L.

Fernandes & Fernandes: 209 (1970); Obermeyer: 102 (1976); Fernandez: 1 (1987).

Sthn trop. Afr. 1: *Turnera oculata* Story, Angola, and sthn Afr.

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Urticaceae

(Dilleniidae—Urticales)
(Eurosids I—Rosales)

Jordaan, M. in Leistner: 552 (2000).

Sthn trop. Afr.: genera 12, species ± 30.

Key to genera

[after Friis (1991)]

1a Plants with stinging hairs (i.e. hairs with a sac-like base, calcified walls and bulbous tip, liberating an irritating fluid), at least on the inflorescences and petioles:
- 2a Stipules free, lateral; shrubs or small trees with soft wood ..... **Obetia**
- 2b Stipules fused, intrapetiolar; woody climbers or erect, short-lived or perennial herbs:
  - 3a Woody climbers with adventitious or axillary roots from the climbing stems; stinging hairs mostly restricted to petioles and inflorescences; female perianth with tepals accrescent, becoming fleshy and orange or red in fruit ..... **Urera**
  - 3b Erect, short-lived or perennial herbs, not climbing and without adventitious or axillary roots from the stems; usually with stinging hairs on all aerial parts of the plant; female perianth membranaceous in fruit:
    - 4a Female perianth of 3 ± united tepals (sometimes also with 1 minute free tepal), forming a 1-sided cover on the ovary or achene; stinging hairs often more than 5 mm long ..... **Girardinia**
    - 4b Female perianth of 4 free, very unequal tepals; stinging hairs shorter than 5 mm ..... **Laportea**

1b Plants completely without stinging hairs:
- 5a Leaves opposite, not or only slightly heteromorphic, the 2 leaves of a pair equal or subequal in size and shape:
  - 6a Inflorescence a pedunculate capitulum with a disc- or bell-shaped receptacle ..... **Lecanthus**
  - 6b Inflorescence not as above, or if receptacle disc- or bell-shaped then capitulum sessile:
    - 7a Stipules fused, intrapetiolar ..... **Pilea**
    - 7b Stipules free, lateral:
      - 8a Male flowers with 4 stamens; inflorescences of long, often pendent, interrupted spikes ..... **Boehmeria**
      - 8b Male flowers with only 1 stamen; inflorescences dense axillary clusters ..... **Droguetia**
- 5b Leaves alternate, or if opposite than the 2 leaves of a pair strongly heteromorphic, being unequal in size and/or shape:

9a Leaves distichous or opposite with the 2 leaves of a pair strongly heteromorphic, sessile or subsessile, asymmetric about the midrib:
10a Inflorescences consisting of sessile capitula with ± disc-shaped or lobed receptacles surrounded by involucral bracts; leaves always distichous ..... **Elatostema**
10b Inflorescences consisting of pedunculate glomerules or of a pedunculate globular receptacle not surrounded by involucral bracts; leaves distichous or opposite in strongly heteromorphic pairs ..... **Procris**
9b Leaves spirally arranged, petiolate, symmetric (or almost so) about the midrib:
11a Inflorescence a lax panicle or an interrupted spike:
12a Woody climber; female perianth with fused accrescent tepals which also become orange or red in fruit ..... **Urera**
12b Erect or prostrate, herbaceous or slightly woody plants; female perianth with free tepals, membranous in fruit ..... **Laportea**
11b Inflorescence an axillary, sessile, ± densely capitulate cluster:
13a Male flowers with 1 stamen; female flowers without a perianth; minute annual herbs ..... **Didymodoxa**
13b Male flowers with 4 or 5 stamens; female flowers with a tubular perianth; annual or perennial herbs or shrubs ..... **Pouzolzia**

Boehmeria Jacq.

Jacquin: 9, 31 (1760); Friis: 44 (1989b); Friis: 106 (1991); Friis: 623 (1993); White *et al.*: 579 (2001).

Shrubs or small trees, sometimes woody-based herbaceous perennials, monoecious or dioecious, usually ± pubescent, stinging hairs absent; cystoliths dot-like. **Leaves** opposite, petiolate, lamina triplinerved, equal- or unequal-sided, dentate, sometimes lobed; stipules lateral, free or ± connate. **Inflorescences** axillary, usually spike-like, with flowers gathered in unisexual glomerules along inflorescence axis (rarely sessile and globular); bracts small, deciduous. **Male flowers** (3)4(5)-merous with membranaceous tepals; rudimentary ovary present or absent. **Female flowers** with tubular perianth, constricted and 2–4-toothed at apex, completely enclosing ovary; style filiform, not articulated, with one-sided filiform stigma. **Achene** completely enclosed in and partly adnate to persistent perianth.

Species ± 50, pantropical and in warm temperate regions; Africa, including sthn trop. Afr. 1: *Boehmeria macrophylla* Hornem., Angola, Zambia, Zimbabwe, Malawi and Mozambique.

Didymodoxa E.Mey. ex Wedd.

Friis & Wilmot-Dear: 45 (1988); Friis: 60 (1989b); Friis: 114 (1991); Friis & Immelman: 29 (2001).
Urtica L., in part.

Sthn trop. Afr. 1: *Didymodoxa caffra* (Thunb.) Friis & Wilmot-Dear, Zambia, and sthn Afr.

Droguetia Gaudich.

Friis & Wilmot-Dear: 36 (1988); Friis: 56 (1989b); Friis: 112 (1991).

Sthn trop. Afr. 1: *Droguetia iners* (Forssk.) Schweinf., Angola, Zimbabwe, Malawi, and sthn Afr.

Elatostema J.R.Forst. & G.Forst.

Forster & Forster: 105 (1775); Friis: 38 (1989b); Friis: 103 (1991); Friis: 621 (1993).

Erect, annual and perennial, monoecious herbs, without stinging hairs; stems prostrate and ascending; cystoliths linear. **Leaves** distichous, alternate, sessile or very shortly petiolate, asymmetrie; stipules fused, intrapetiolar (presence of 2 pairs of stipules indicates that genus has opposite leaves but one leaf of each pair is rudimentary or totally reduced). **Inflorescences** unisexual, axillary, sessile, consisting of very densely clustered flowers and surrounded by almost free bracts in male infloreseences or by somewhat fused braets in female inflorescences. **Male flowers** 4- or 5-merous; tepals generally with a horn-like dorsal appendage; rudimentary ovary absent or indistinct. **Female flowers** with 3–5 very reduced tepals and 3 scale-like staminodes, sometimes sterile. **Ovary** ovoid with penicillate stigma. **Achene** ovoid, small, ejected by reflexed staminodes.

Species ± 200, often very polymorphic, in the tropics of the Old World; sthn trop. Afr. 3: Angola, Zambia, Zimbabwe, Malawi and Mozambique.

Girardinia Gaudich.

Friis: 143 (1981); Friis: 12 (1989b); Friis: 85 (1991). Friis: 621 (1993); White *et al.*: 581 (2001).

Sthn trop. Afr. 1: *Girardinia diversifolia* (Link) Friis, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Laportea Gaudich.

Friis: 15 (1989b); Friis: 88 (1991); Friis: 620 (1993); Friis & Immelman: 10 (2001); White *et al.*: 581 (2001).

Fleurya Gaudich.; Burtt Davy *et al.*: 100 (1958).

Sthn trop. Afr. 6: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lecanthus Wedd.

Weddell: 187 (1854); Friis: 101 (1991); Friis: 623 (1993).

Annual or short-lived perennial herbs, monoecious or apparently dioecious, without stinging hairs; cystoliths elongated. **Leaves** opposite, petiolate; stipules intrapetiolar, fused. **Inflorescences** single in leaf axils, unisexual, rarely bisexual, pedunculate; receptacles surrounded by fused bracts. **Male inflorescences** usually small, ± bell- or cup-shaped, usually with less than 10 male flowers; male flowers 4- or 5-merous, with rudimentary ovary. **Female inflorescences** larger, with many flowers on a flat, disc-shaped receptacle; flowers (3)4-merous, tepals ± markedly cucullate, ovary erect, stigma penicillate, staminodes present. **Achene** ovoid, verrucose.

Monotypic, very polymorphic, mountains of Old World tropics: *Lecanthus peduncularis* (Royle) Wedd.; sthn trop. Afr.: Malawi.

Obetia Gaudich.

Friis: 221 (1983); Friis: 85 (1991). Friis: 620 (1993); Coates Palgrave: 154 (2002).

Urticastrum Heist.; Hiern: 987 (1900); Bingham (Unpublished).

Sthn trop. Afr. 2: Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Pilea Lindl.

Friis: 557 (1989a); Friis: 25 (1989b); Friis: 96 (1991); Friis: 622 (1993).

Sthn trop. Afr. 5: Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Pouzolzia Gaudich.

Friis & Jellis: 587 (1984); Friis: 46 (1989b); Friis: 108 (1991); Bingham & Smith: 156 (2002); Coates Palgrave: 155 (2002); Kravtsova *et al.*: 297 (2003).

Sthn trop. Afr. 5 or 6: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Procris Comm. ex Juss.

Jussieu: 403 (1789); Friis: 42 (1989b); Friis: 101 (1991); Friis: 622 (1993).

Perennial herbs, often epiphytic or epilithic, monoecious or dioecious by abortion, without stinging hairs; stems juicy or succulent. **Leaves** distichous, opposite and heteromorphous with one leaf of each pair reduced in size, or leaves apparently alternate, with one in each pair completely reduced; lamina crenate or serrate, rather fleshy, penninerved, with linear cystoliths; stipules intrapetiolar, fused. **Inflorescences** unisexual, pedunculate, in axils of existing or fallen leaves; male inflorescences: flowers in small pedunculate glomerules; female inflorescences capitate with fleshy receptacles on short fleshy peduncles. **Male flowers** pedicellate, pentamerous (rarely tetramerous), with rudimentary pistilode. **Female flowers** sessile with a persisting perianth of 4 or 5 free tepals; ovary erect, symmetrical, with a penicillate stigma. **Achene** ovoid, surrounded at base by accrescent perianth.

Species ± 10, mostly in humid habitats in Old World tropics; 1 in sthn trop. Afr.: *Procris crenata* C.B.Rob., Angola, Zimbabwe, Malawi, Mozambique.

Urera Gaudich.

Friis: 5 (1989b); Friis: 80 (1991); Friis: 621 (1993). Friis & Immelman: 7 (2001); White *et al.*: 582 (2001); Coates Palgrave: 154 (2002).

Sthn trop. Afr. 3: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Vahliaceae

(Rosidae—Rosales)
(Euasterids I)

Jordaan, M. in Leistner: 556 (2000).

Sthn trop. Afr.: genus 1, species 3.

Vahlia Thunb.

Mendes: 22 (1970); Bridson: 163 (1975); Bridson: 48 (1978); Al-Shammary & Gornall: 117 (1994); Izidine & Bandeira: 52 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Valerianaceae
(Asteridae—Dipsacales)
(Euasterids II—Dipsacales)

Welman, W.G. in Leistner: 556 (2000).

Valeriana L.

Meyer: 761 (1958); Kokwaro: 1 (1968); Cannon: 75 (1983).

Sthn trop. Afr. 1: *Valeriana capensis* Thunb., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Verbenaceae
(Asteridae—Lamiales)
(Euasterids I—Lamiales)

Retief, E. in Leistner: 557 (2000).

Sthn trop. Afr.: genera 7, species 42 (including naturalised exotics). *Clerodendrum*, *Karomia*, *Premna* and *Vitex* [see Sales: 189 (2001)] are placed under Lamiaceae.

Chascanum E.Mey.

Moldenke: 113, (1938a); Moldenke: 300 (1938b); Moldenke: 1 (1939); Fernandes: 295 (1990); Verdcourt: 11 (1992).

Bouchea Cham.; Baker & Stapf: 281 (1900). *Plexipus* Raf.; Fernandes: 265 (1984b).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

*Duranta L.

Linnaeus: 637 (1753); Baker & Stapf: 287 (1900); Burtt Davy *et al.*: 101 (1958); White: 368 (1962); Sanders: 308 (1984); Coates Palgrave: 976 (2002); Mapaura (Unpublished).

Species 17, tropical America; some species widely cultivated and naturalised; sthn trop. Afr. 1: **Duranta repens* L., recorded from Angola, Zambia, Zimbabwe, Malawi. **D. erecta* L. has escaped from cultivation in sthn Afr.

Lantana L.

Fernandes: 254 (1986); Fernandes: 125 (1988); Verdcourt: 37 (1992); White *et al.*: 587 (2001); Coates Palgrave: 976 (2002).

Sthn trop. Afr. 13 (including naturalised species), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lippia L.

Fernandes: 245 (1986); Verdcourt: 27 (1992); White *et al.*: 588 (2001); Coates Palgrave: 976 (2002).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Phyla Lour.

Verdcourt: 25 (1992).

Lippia as to *L. nodiflora* (L.) Michx.; Baker & Stapf: 279 (1900); Hiern: 829 (1900).

Sthn trop. Afr. 1: *Phyla nodiflora* (L.) Michx., Angola, and in sthn Afr.

Priva Adans.

Fernandes: 33 (1985); Verdcourt: 20 (1992).

Sthn trop. Afr. 6, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stachytarpheta Vahl

Fernandes: 87 (1984a); Verdcourt: 17 (1992).

Valerianoides Medik.; Hiern: 830 (1900).

Sthn trop. Afr. 5 (of which 2 or 3 may be indigenous), Angola, Zimbabwe, Mozambique, and in sthn Afr.

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FERNANDES, R. 1985. Notes sur les Verbenaceae. III—Remarques sur quelques espèces du genre *Priva* Adans. *Botanica Helvetica* 95(1): 33–45.
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FERNANDES, R.B. 1988. Notes sur les Verbenaceae VII—Remarques sur quelques espèces africaines du genre *Lantana* L. *Boletim da Sociedade Broteriana*, sér. 2, 61: 125–214.
FERNANDES, R.B. 1990. Notes sur les Verbenaceae VIII—Deux nouvelles combinaisons dans *Chascanum* E.Mey. *Boletim da Sociedade Broteriana*, sér. 2, 63: 295–296.

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Violaceae

(Dilleniidae—Violales)
(Eurosids I—Malpighiales

Bredenkamp, C.L. in Leistner: 559 (2000).

Sthn trop. Afr.: genera 3, species ± 30.

Hybanthus Jacq.

Exell & Mendonça: 76 (1937/1951); Robson: 254 (1960); Mendes: 103 (1970); Robson & Vidigal: 10 (1973); Grey-Wilson: 103 (1981); Grey-Wilson: 29 (1986); Turner & Escobar: 501 (1991).

Calceolaria Loefl.; Hiern: 34 (1896).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rinorea Aubl.

Exell: 17 (1926); Exell & Mendonça: 68, 360 (1937/1951); Robson: 246 (1960); Taton: 2 (1969); Robson & Vidigal: 2 (1973); Grey-Wilson: 110 (1981); Grey-Wilson: 2 (1986); Dowsett-Lemaire & White: 85 (1990); White *et al.*: 589 (2001); Coates Palgrave: 742 (2002); Mapaura & Timberlake: 169 (2002); Lebrun & Stork: 170 (2003).

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Viola L.

Robson: 258 (1960); Robson & Vidigal: 15 (1973); Grey-Wilson: 123 (1981); Grey-Wilson: 25 (1986).

Sthn trop. Afr. 1: *Viola abyssinica* Steud. ex Oliv., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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TURNER, B.L. & ESCOBAR, L.K. 1991. Documented chromosome numbers 1991: 1. Chromosome numbers in *Hybanthus* (Violaceae). *Sida* 14(3): 501–503.

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Viscaceae

(Rosidae—Santalales)
(Core Eudicots—Santalales; under Santalaceae)

Germishuizen, G. in Leistner: 560 (2000).
Polhill & Wiens: 275 (1998).

Sthn trop. Afr.: Genus 1, species 16.

Viscum L.

Polhill & Wiens: 279 (1998); Polhill: 592 (2001); Izidine & Bandeira: 52 (2002).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn. Afr.

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Vitaceae
(Ampelidaceae)
(Rosidae—Rhamnales)
(Rosids)

Retief, E. in Leistner: 561 (2000).

Sthn trop. Afr.: genera 5, species ± 135.

Ampelocissus Planch.

Exell & Mendonça: 35 (1954/1956); White: 230 (1962); Wild & Drummond: 439 (1966); Wild *et al.*: 2 (1969); Verdcourt: 2 (1993); White *et al.*: 596 (2001).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cayratia Juss.

Wild & Drummond: 491 (1966); Wild *et al.*: 51 (1969); Verdcourt: 136 (1993).

Cissus L. in part; Exell & Mendonça: 55 (1954/1956).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cissus L.

Exell & Mendonça: 40 (1954/1956); Wild & Drummond: 448 (1966); Wild *et al.*: 14 (1969); Verdcourt: 12 (1993); Descoings: 452 (2002); White *et al.*: 596 (2001); Coates Palgrave: 680 (2002); Izidine & Bandeira: 52 (2002).

Sthn trop. Afr. ± 30, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cyphostemma (Planch.) Alston

Wild & Drummond: 459 (1966);Wild *et al.*: 28 (1969); Retief & Glen: t. 1956 (1987); Percy-Lancaster & Richards: 78 (1992); Retief: t. 2074 (1993); Verdcourt: 48 (1993); White *et al.*: 598 (2001); Bingham & Smith: 144 (2002); Coates Palgrave: 680 (2002); Descoings: 456 (2002); Izidine & Bandeira: 52 (2002); Mapaura & Timberlake: 169 (2002).

Cissus L. in part; Exell & Mendonça: 40 (1954/1956).

Sthn trop. Afr. ± 72, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rhoicissus Planch.

Exell & Mendonça: 39 (1954/1956); Wild & Drummond: 444 (1966); Wild *et al.*: 7 (1969); Verdcourt: 8 (1993); White *et al.*: 601 (2001); Coates Palgrave: 676 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Zygophyllaceae
(Rosidae—Sapindales)
(Eurosids I)

Retief, E. in Leistner: 563 (2000).
Sheahan & Chase: 279 (1996).

Sthn trop. Afr.: genera 2, species 6.

Tribulus L.

Exell & Mendonça: 255 (1951); Launert: 126 (1963); Launert & Gonçalves: 1 (1969); Lebrun & Stork: 784 (2003) under Tribulaceae.

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Zygophyllum L.

Exell & Mendonça: 256 (1951); Launert: 125 (1963).

Sthn trop. Afr. 2, Angola, and sthn Afr.

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MONOCOTYLEDONS

*Agavaceae

(Liliidae—Asparagales)
(Monocots—Asparagales)
Compiled by G.F. Smith

Smith, G.F. in Leistner: 567 (2000). Additional family reference: Irish & Irish: 20 (2000).

Amended family notes [following Verhoek: 60 (1998)]: Genera 8, species ± 300, exclusively New World tropics, subtropics and temperate, widely naturalised; sthn trop. Afr.: genera 2, species 3.

Key to genera

Flowers erect; perianth fused into a tube below the middle; filaments and style not swollen; bulbils plant-like ..... ***Agave**
Flowers pendulous; perianth segments ± free; filaments swollen at base; style base dilated, 3-angled; bulbils globular ..... ***Furcraea**

*Agave L.

White: 15 (1962); Thiede: 6 (2001); Coates Palgrave: 117 (2002).

Manfreda Salisb. *Runyonia* Rose. *Littaea* Tagl.

**Agave americana* L. and **A. sisalana* Perrine from central America have become naturalised in many areas; also in sthn Afr.

*Furcraea Vent.

Ventenat: 65 (1793); Drummond: 41 (1907); Forster: 77 (1986); Couper: 277 (1986); Kahn: 142 (1997); Thiede: 78 (2001).

Caudex up to 1.2 m tall. **Leaves** vibrant or glaucous green, in a terminal rosette. **Flowers** pendulous, campanulate, often replaced by small, globular bulbils. **Perianth** mostly free, forming a very short tube. **Filaments** swollen below middle. **Style** stout, swollen basally with 3 prominent angles.

Species ± 20, tropical America; sthn trop. Afr. 1, introduced: **Furcraea foetida* (L.) Haw. (=**F. gigantea* Vent.), escaped from sites of habitations and plantations for fibre production, mainly in the bushveld and subtropical areas; it is colloquially known as Mauritius hemp or Green Aloe, and is naturalised in Zambia and Zimbabwe. Although not yet recorded from Angola, Malawi or Mozambique, it more than likely also occurs in the subtropical areas of these countries.

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Alismataceae

(Alismatidae—Alismatales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 567 (2000).

Sthn trop. Afr.: genera 6, species 8.

Identification of additional genus using the key in the above reference: **Ranalisma** runs to *Alisma* from which it can be distinguished by its more than 20 carpels arranged on an elongated receptacle.

Alisma L.

Carter: 5 (1960); Wild: 36 (1961); Obermeyer: 96 (1966); Björkqvist: 1 (1967); Björkqvist: 1 (1968); Haynes *et al.*: 16 (1998).

Sthn trop. Afr. 1: *Alisma plantago-aquatica* L., Mozambique, and in sthn Afr.; perhaps introduced in Africa [Björkqvist (1967)].

Burnatia Micheli

Carter 13: (1960); Symoens: 20 (1984).

Sthn trop. Afr. 1: *Burnatia enneandra* Micheli, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Caldesia Parl.

Carter: 7 (1960); Symoens: 10 (1984).

Sthn trop. Afr. 1: *Caldesia reniformis* (D.Don) Makino, Angola, Zambia, and sthn Afr.

Limnophyton Miq.

Carter: 7 (1960); Symoens: 14 (1984).

Sthn trop. Afr. 2: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ranalisma Stapf

Stapf: t. 2652 (1900); Carter: 2 (1960); Hepper: 9 (1968); Symoens: 4 (1984); Haynes *et al.*: 16 (1998).

Marsh herbs, acaulescent, scapigerous, perennial or annual; rhizome, if present, short. **Leaves** all basal, submersed or emersed; petiole long, sheathing at base but open; blade linear-lanceolate to broadly elliptic, with 1 or 2 pairs of prominent nerves and prominent cross-veins. **Inflorescence** with flowers usually solitary, or 2 or 3 in an umbel; flowers occasionally replaced by vegetative buds. **Flowers** bisexual, with a convex receptacle elongating after anthesis. **Petals** slightly longer than sepals, delicate, caducous, white. **Stamens** (6–)9(–12); filaments filiform. **Carpels** many, up to 70, free, on an elongated receptacle; styles terminal, hooked; ovule 1, rarely 2 or 3, basal. **Achenes** laterally compressed, with a dorsal wing, nearly semicircular, with terminal beak formed by remains of style.

Species 2, Old World tropics, 1 widely distributed in Africa: *Ranalisma humile* (Kunth) Hutch.; sthn trop. Afr.: Angola, Zambia.

Wiesneria Micheli

Carter: 11 (1960) as *Wisneria*; Hepper: 10 (1968); Haynes *et al.*: 17 (1998).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, and sthn Afr.

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Alliaceae

(Liliidae—Asparagales)
(Monocots—Asparagales)

Meyer, N.L. in Leistner: 569 (2000).

Sthn trop. Afr.: genera 2 (1 exotic), species 7 (1 exotic).

*Nothoscordum Kunth

**N. cordatum* is an introduced, nearly cosmopolitan, troublesome weed.

Tulbaghia L.

Burbidge: 77 (1978); Rahn: 75 (1998); Vosa & Condy: 24 (2001).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Amaryllidaceae

(Liliidae—Asparagales)
(Monocots—Asparagales)

Snijman, D.A. in Leistner: 570 (2000).
Meerow & Snijman: 83 (1998); Meerow *et al.*: 372 (2000).

Sthn trop. Afr.: genera 7, species ± 21.

Identification of additional genus using the key in the above reference: Cryptostephanus keys out to *Clivia* from which it differs in having a corona of 6 or 12 scales inside the perianth tube.

Ammocharis Herb.

Milne-Redhead & Schweickerdt: 159 (1939); Nordal: 19 (1982); Meerow & Snijman: 97 (1998).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, and sthn Afr.

Boophone Herb.

Nordal 21: (1982); Meerow & Snijman: 97 (1998); Van Jaarsveld: 224 (2001).

Sthn trop. Afr. 1: *Boophone disticha* (L.f.) Herb., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Crinum L.

Nordal: 9 (1982); Meerow & Snijman: 97 (1998); Archer & Condy: 30 (1999); Nordal & Sebsebe Demissew: 465 (2002).

Sthn trop. Afr. ± 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cryptostephanus Welw. ex Baker

Baker: 193 (1878); Baker: 383 (1898); Rendle: 32 (1899); Verdoorn: t. 885 (1943); Nordal: 7 (1982); Meerow & Snijman: 98 (1998).

Evergreen rhizomatous herbs. **Rhizome** subbulbous, tunicated. **Leaves** several, distichous, firm, strap-shaped, obtuse, without midrib. **Inflorescence** a many-flowered, compact cluster; scape stout, fleshy, solid, shorter than leaves, compressed with 2 sharp edges, to narrowly winged, persisting in fruit; spathe valves several, unequal, soon withering. **Flowers** regular or weakly irregular; very narrowly to widely funnel-shaped, erect to spreading, white often tinged pink or dark purplish to almost black; pedicels ± as long as segments, 3 outer segments slightly narrower than inner 3, connivent to spreading. **Corona** of 12 linear or 6 bifid scales arising at base of each tepal. **Stamens** arising in 2 rows in perianth tube, 3 lower stamens subsessile, upper 3 on filaments shorter than anthers. **Ovary** globose; ovules 2–many per locule; style short and stout, or long-filiform and exserted; stigma capitate. **Fruit** a subglobose, red berry. **Seeds** turgid, with phytomelanous coat.

Species 5, trop. Africa; sthn trop. Afr. 2, Angola, Zimbabwe.

Cyrtanthus Aiton

Nordal: 183 (1979); Nordal: 23 (1982); Meerow & Snijman: 98 (1998); Van Jaarsveld: 225 (2001).

Anoiganthus Baker; Binns: 18 (1968).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and mainly sthn Afr.

Pancratium L.

Björnstad: 281 (1973); Nordal: 26 (1982); Meerow & Snijman: 100 (1998).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Scadoxus Raf.

Nordal: 3 (1982); Meerow & Snijman: 98 (1998); Mapaura & Timberlake: 161, 178 (2002).

Haemanthus L. in part.

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Anthericaceae

(Liliidae—Asparagales)
(Monocots—Asparagales; under Agavaceae)

Meyer, N.L. in Leistner: 576 (2000).

Sthn trop. Afr.: genus 1, species ± 35.

Chlorophytum Ker Gawl. emend. Nordal

Nordal *et al.*: 1 (1997); Conran: 119 (1998); Nordal & Poulsen: 937 (1998); Van Jaarsveld: 228 (2001).

Anthericum L. in part.

Sthn trop. Afr. ± 35, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Aponogetonaceae
(Alismatidae—Najadales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 577 (2000).

Sthn trop. Afr.: genus 1, species 7.

Aponogeton L.f.

Van Bruggen: 193 (1973); Symoens: 48 (1989); Lye: 1 (1989); Van Bruggen: 21 (1998).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Araceae
(including Lemnaceae)
(Arecidae—Arales)
(Monocots—Alismatales)

References in Leistner (2000): Araceae: Singh, Y.: 578; Lemnaceae: Glen, R.P.: 640. General family references: Landolt: 1 (1980); Landolt & Kandeler: 1 (1987); Landolt: 147 (1993); Les *et al.*: 161 (1997); Landolt: 264 (1998); Hesse *et al.*: 26 (2001); Les *et al.*: 221 (2002); Angiosperm Phylogeny Group: 416 (2003).

Sthn trop. Afr.: genera 17 (2 exotic), species 44 (2 exotic).

Additional family characters (Lemnaceae): Small to minute, glabrous, floating freshwater herbs, forming a discoid, oblong, strap-shaped or globular body (frond), with or without roots, viviparous, gregarious, usually monoecious. **Roots**, if present, with or without a basal sheath, with a large calyptra. **Flowers** unisexual, without perianth, rarely produced.
Additional terminology: **flagelliform**: slender, tapering and whip-like; **lactifer**: duct containing latex; **pedati-** (as in **pedatifid**, **pedatisect**): literally *foot-shaped*; of a leaf divided ± palmately in such a way that the midribs of the lateral segments (or lobes or pinnae) do not arise all together at the apex of the petiole but successively on basal ribs arising to either side from the petiole apex; **sympodium**: a shoot axis built up by a linear series of units (sympodial units), each new distal unit developing from a single apical meristem arising from an axillary bud situated on the previous unit.

Key to genera

1a Aquatic herbs, free-floating; leaves forming a densely pilose rosette; inflorescence hidden, with a single female flower and a few male flowers .. ***Pistia**
1b Terrestrial herbs with subterranean tubers or rhizomes; leaves glabrous or subglabrous; inflorescence with few to many female flowers and several male flowers:
2a Lamina of mature leaves compound; spadix with or without a terminal naked appendix:
3a Spadix ending in a naked appendix:
4a Leaf solitary in each growth period; leaf blade essentially sagittate to trisect but with main divisions highly dissected and subdivided ..... **Amorphophallus**
4b Leaves usually several; leaf blade deeply pedatifid to pedatisect ..... **Remusatia**
3b Spadix not ending in an appendix but usually with zone of male flowers reaching the apex:
5a Leaves few to many:
6a Leaves pinnatisect, erect; leaflets oblong-elliptic, deciduous, leaving persistent petiole; lactifers absent ..... **Zamioculcas**
6b Leaves trifid to laciniate-pinnatifid with slit-like perforations extending to the margin; lactifers present ..... **Cercestis**
5b Leaf solitary:
7a Flowers with fleshy perianth; ultimate lobes of leaves broadly elliptic to linear ..... **Gonatopus**
7b Flowers lacking a perianth; ultimate lobes of leaves trapezoid ..... **Anchomanes**
2b Lamina of mature leaves simple; spadix without or with a naked terminal appendix:
8a Spadix with a naked terminal appendix; leaves peltate ..... ***Colocasia**
8b Spadix without a terminal sterile appendix; leaves not peltate or peltate (*Remusatia*):
9a Flowers with a fleshy perianth; inflorescence borne at or below ground level; anthers borne on slender filaments ..... **Stylochaeton**
9b Flowers without a perianth; inflorescence, if basal, borne above ground level:

10a Stamens of male flowers connate into synandria:
11a Leaves 1 or 2, peltate, radical; petiole not geniculate at apex ..... **Remusatia**
11b Leaves several; petiole geniculate, attached to base of lamina ..... **Anubias**
10b Stamens of male flowers free:
12a Leaves radical; peduncle radical, much longer than the spathe ..... **Zantedeschia**
12b Leaves cauline; peduncle cauline, shorter to not much longer than the spathe:
13a Lactifers present; flagelliform shoots present; leaf blade oblong-lanceolate, cordate, hastate or rarely trifid to pinnatifid .... **Cercestis**
13b Lactifers absent; flagelliform shoots absent; leaf blade always simple, acute to rounded at base ..... **Culcasia**

Amorphophallus Blume ex Decne.

Binns: 19 (1968); Mayo: 28 (1985); Ntépé-Nyame: 26 (1988); Ittenbach: 1 (1997) [not seen]; Ittenbach & Lobin: 147 (1997); Mayo *et al.*: 235 (1997); Mayo *et al.*: 64 (1998); Mapaura (Unpublished).

Hydrosme Schott; Rendle: 86 (1899).

Sthn trop. Afr. ?9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anchomanes Schott

Schott: 314 (1853); Brown: 161 (1901); Engler: 51 (1911); Mayo & Bogner: 24 (1985); Mayo *et al.*: 218 (1997); Mayo *et al.*: 62 (1998).

Herbs, often very robust. **Stem** a small to gigantic, erect to rhizomatous, seasonally dormant tuber. **Leaves** solitary, basal, often gigantic; petiole very long, terete, aculeate, rarely smooth, sheath very short; blade saggitate at first, later trisect with primary divisions divided ± dichotomously or pinnately, secondary divisions irregularly pinnatifid, ultimate lobes very variable in size and shape; primary lateral veins of ultimate lobes pinnate, mostly running into margin, higher order venation reticulate. **Inflorescence** solitary, usually appearing before leaf; peduncle shorter than petiole, usually aculeate. **Spathe** erect, boat-shaped, narrowly oblong-lanceolate to oblong-elliptic, not constricted, basally convolute or not, apex marcescent. **Spadix** cylindric, sessile to subsessile, much shorter to subequal to spathe; female zone subequal to male zone or much shorter; male zone contiguous with female, fertile up to apex. **Flowers** unisexual; perianth 0. **Male flowers**: stamens free; anthers sessile or filaments short; thecae ovate-oblong, opposite, dehiscing by apical slit. **Female flowers**: ovary 1-locular; ovule 1, erect, anatropous, placenta basal; stylar region shortly conic or 0; stigma 2-lobed to V-shaped, discoid or depressed-globose. **Fruit** a large, oblong-ellipsoid berry borne in a cylindric, red to partly white spike. **Seeds** obovoid to oblong-ovoid; testa very thin, smooth, transparent; embryo large, green; endosperm absent. $x = 20$; chromosomes very large.

Species 7 or 8, trop. Africa; 2 in sthn trop. Afr., Angola, Zambia, ?Malawi, Mozambique.

Anubias Schott

Schott: 398 (1857); Brown: 182 (1901); Engler: 2 (1915); Crusio: 1 (1979); Ntépé-Nyame: 10 (1988); Mayo *et al.*: 180 (1997); Mayo *et al.*: 56 (1998).

Amauriella Rendle: 115 (1913).

Evergreen herbs; rhizome thick, creeping, with short internodes. **Leaves** several; petiole usually smooth, rarely shortly and sparsely spiny, geniculate apically; sheath relatively short; blade simple to trifid, lanceolate, ovate, elliptic, nearly triangular to subsagittate, glabrous or midrib and primary veins densely pilose abaxially, primary lateral veins pinnate, secondary lateral veins parallel-pinnate, tertiaries transverse between them. **Inflorescence** 1–3 in each floral sympodium; peduncle ± as long as petiole or shorter. **Spathe** elliptic-ovate, or ovate, not constricted, only weakly differentiated into tube and blade, slightly convolute at base, closing after anthesis and persistent to fruiting stage, uniformly green or cream to reddish tinged, paler within. **Spadix** cylindric, shorter or sometimes much longer than spathe, sessile or stipitate; female zone free, usually densely flowered, shorter than male zone and usually contiguous with it, rarely with bisexual flowers between; male zone fertile to apex. **Flowers** unisexual; perianth 0. **Male flowers**: synandrium of 3–8 stamens; filaments connate, short, connectives thick, fleshy; thecae lateral or marginal or ± completely covering synandrium, dehiscing by longitudinal slits. **Female flowers**: ovary (1–)2 or 3-locular; ovules many per locule, anatropous; placenta axile; stylar region narrower than ovary; stigma discoid. **Fruit** a depressed-globular to obovoid, green to pale green many-seeded berry. **Seeds** small, irregularly ovoid to subcylindric; testa rough, thickish; embryo axile, elongate; endosperm copious. $x = 24, 36$.

Species 8, tropical west and central Africa; sthn trop. Afr. 1: *Anubias heterophylla* Engl., Angola.

Cercestis Schott

Schott: 414 (1857); Ntépé-Nyamè: 64 (1988); Mayo *et al.*: 228 (1997); Mayo *et al.*: 63 (1998).

Perennial herbs, climbing to creeping, small to robust, with simple, articulated lactifers; stem long with long internodes, bearing only small scale leaves, followed by thicker flowering stems with several foliage leaves and short internodes. **Leaves** many; petiole forming short to long sheath, ± clearly geniculate at apex; blade oblong-lanceolate or oblong to cordate, sagittate or hastate, or trifid with acuminate segments, sometimes laciniate-pinnatifid with slit-like perforations extending to margin; resin canals pellucid, linear or punctate; primary lateral veins pinnate, running into marginal vein, higher order venation reticulate. **Inflorescences** usually 1–4 in each floral sympodium; peduncle shorter than spathe. **Spathe** erect, thick, boat-shaped to subcylindric, convolute basally into a tube, gaping apically at anthesis, persistent to marcescent. **Spadix** sessile, shorter than spathe; female zone shorter than and contiguous with male. **Flowers** unisexual; perianth 0. **Male flowers** with 2–4 free anthers on very short filaments and broad connectives; thecae shortly oblong to almost linear, opening by small apical slit. **Female flowers**: ovary 1-locular, obovoid; ovule 1; placenta parietal to subbasal; stigma ± sessile, discoid. **Fruit** an obovoid to ellipsoid red berry with thick pericarp, arranged in ellipsoid to oblong

infructescence. **Seed** obovoid to ellipsoid; testa thin, smooth; embryo large, outer cell layer green; endosperm 0. $x = 21$.

Species 13, trop. Africa; sthn trop. Afr. 1: *Cercestis congensis* Engl., Angola.

*Colocasia Schott

Schott: 18 (1832); Binns: 19 (1968); Mayo: 5 (1985); Mayo *et al.*: 280 (1997); Mayo *et al.*: 71 (1998).

[Description of **Colocasia esculenta* (L.) Schott, from Mayo (1985)]: Robust, acaulescent herb to 2 m high or more; stem a swollen starchy tuber. **Leaf** broadly ovate in outline, peltate, cordate-saggitate, held pendent from ± erect petiole, apex obtuse, basal lobes ± rounded, primary lateral veins arching towards margin and forming regular, parallel series. **Spathe** 0.2–0.3 m long, basal tube green, short; apical blade yellow to orange, much longer. **Spadix** shorter than spathe, with conic sterile appendage up to 40 mm long (occasionally reduced to absent). **Flowers** unisexual; tepals 0.

**Colocasia esculenta* (L.) Schott is cultivated and naturalised throughout the humid tropics and subtropics.

Culcasia P.Beauv.

Palisot de Beauvois: 3 (1805) name conserved; Brown: 173 (1901); Hepper: 315 (1967); Mayo: 16 (1985); Ntépé-Nyamè: 76 (1988); Mayo *et al.*: 225 (1997); Mayo *et al.*: 63 (1998); White *et al.*: 91 (2001).

Perennial herbs, erect, repent or climbing, with slender branches, rooting at least from lower nodes; lactifers 0. **Leaves** many, often forming a terminal crown; petiole with fairly long, persistent sheath, ± clearly pulvinate apically; blade lanceolate to ovate-oblong; resin canals pellucid, linear or punctate; primary lateral veins pinnate, often forming a submarginal collective vein. **Inflorescences** 1–12(–20) in each floral sympodium; peduncle short to relatively long. **Spathe** erect, boat-shaped, erect, green to whitish, convolute basally, gaping apically at anthesis, deciduous to marcescent. **Spadix** cylindric-clavate, subsessile to stipitate, ± equal to spathe in length; female zone usually densely flowered, shorter than male zone, contiguous with it or separated by a laxly-flowered zone of sterile male flowers; male zone fertile to apex; axis often persistent in fruit. **Flowers** unisexual; perianth 0. **Male flowers**: stamens 2–4, free, short; anthers subsessile, connective thick, thecae oblong, dehiscing by a short apical slit. **Sterile male flowers** with 3 or 4 obpyramidal depressed staminodia. **Female flowers**: ovary 1–3-locular, depressed; ovule 1 per locule, anatropous; placenta subbasal; stigma sessile, hemispheric-discoid. **Fruit** a 1–3-seeded, globose to ellipsoid berry, mostly red, sometimes orange to greenish yellow; infructescence subglobose to cylindric. **Seeds** ovoid to ellipsoid; testa thin, smooth, brown; plumule lateral; endosperm 0. $x = 21, 42$.

Species ± 27, trop. Africa; sthn trop. Afr. 4, Angola (including Cabinda), Zambia, Zimbabwe, Malawi and Mozambique.

Gonatopus Hook.f. ex Engl.

Binns: 19 (1968); Mayo: 9 (1985); Mayo *et al.*: 149 (1997); Mayo *et al.*: 51 (1998).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lemna L.

Hepper: 1 (1973); Landolt: 262 (1986); Landolt: 117 (1994).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Pistia L.

Wild: 13 (1961); Binns: 19 (1968); Mayo: 66 (1985); Mayo *et al.*: 286 (1997); Mayo *et al.*: 71 (1998).

Monotypic genus: **Pistia stratiotes* L., pantropical; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Remusatia Schott

Schott: 18 (1832); Mayo: 40 (1985); Ntépé-Nyamè: 56 (1988); Mayo *et al.*: 280 (1997); Mayo *et al.*: 70 (1998).

Small to medium, seasonally dormant perennial herbs; tuber subglobose, producing erect to spreading unbranched or branched stem branches from axils of small deciduous scale leaves; stem branches producing small, scaly, ovoid tubercles at nodes. **Leaves** 1 or 2, basal; petiole sometimes slender with relatively short sheath; blade peltate, cordate-lanceolate to cordate-ovate, basal ribs well-developed, primary lateral veins pinnate, forming submarginal collective vein very close to margin. **Inflorescence** solitary, appearing with or without leaf; peduncle shorter than petiole. **Spathe** strongly constricted between tube and fully expanded or convolute blade; tube with convolute margins, persistent, enclosing female and sterile zone of spadix; blade yellow or red, longer than tube, later deciduous. **Spadix** much shorter than spathe, sessile or subsessile; female zone subcylindric, ± half as long as spathe tube, separated from male zone by a much narrower zone of sterile male flowers; male zone ellipsoid or subclavate, obtuse, fertile to apex. **Flowers** unisexual; perianth 0. **Male flowers** with 2 or 3 stamens connate into a 4–6-sulcate synandrium with 4 or 6 oblong to ellipsoid thecae dehiscing by an apical pore-like slit. **Sterile male flowers** each consisting of an elongated sterile synandrium. **Female flowers**: ovary 1-locular or partially 2–4-locular at apex; ovules many, hemiorthotropous; placentas 2–4 and parietal, or 1 and basal; stigma ± sessile, discoid-capitate to slightly 3- or 4-lobed. **Fruit** an obovoid to globose, many-seeded berry; infructescence ellipsoid, borne within persistent spathe tube. **Seeds** ellipsoid to subglobose, covered by thick, succulent sarcotesta or testa irregularly costate; embryo axile, short; endosperm copious. $x = 14, 21, 28$.

Species 4, trop. Africa, Madagascar, tropical Asia to Indonesia and Australia; sthn trop. Afr. 1: *Remusatia vivipara* (Roxb.) Schott, Zambia.

Sauromatum Schott

Schott: 17 (1832); Mayo: 56 (1985); Mayo *et al.*: 263 (1997); Mayo *et al.*: 68 (1998).

Perennial herbs, small to medium, seasonally dormant; tuber subglobose or depressed-globose, sometimes large. **Leaves** usually solitary, rarely up to 3; petiole cylindric, erect, long, often spotted; sheath very short; blade deeply pedatifid to pedatisect; primary lateral veins of lobes pinnate, forming submarginal collective vein. **Inflorescence** solitary, appearing with or without leaves, borne at ground level; peduncle very short. **Spathe** slightly constricted between tube and blade; tube with

connate margins, ± cylindric and usually somewhat ventricose; blade longer than tube, narrowly oblong-lanceolate, erect at first, then reflexed and spiralled-revolute, margins undulate, inner surface conspicuously spotted. **Spadix** cylindric, ± as long as spathe, free, sessile; female zone short, separate from male zone by a much longer zone with sterile flowers in lower part and naked above; male zone short, followed by a very long-exserted, relatively slender, smooth, cylindric appendix, suberect to somewhat forward-curving. **Flowers** unisexual; perianth 0. **Male flowers** with few free, ± sessile anthers; thecae oblong-ovoid, dehiscing by a broad apical slit. **Sterile flowers** consisting of distant, patent, filiform to terete staminodes with rounded to obliquely truncate-disciform apex. **Female flowers**: ovary 1-locular; ovules 1–4, orthotropous, with very short funicle on basal placenta; stigma subsessile, capitate. **Fruit** an obpyramidal, reddish purple berry, densely congested in subglobose, sometimes slightly hypogeal infructescence. **Seeds** inversely turnip-shaped; testa thin, dark-spotted, smooth to rough; strophiole present; embryo axile, elongate and curved; endosperm copious. $x = 13, 26, 52$.

Species 2, trop. Africa to subtropical southern Asia; sthn trop. Afr. 1: *Sauromatum venosum* (Aiton) Kunth, Angola, Zambia, Malawi.

Spirodela Schleid.

Landolt: 243 (1986); Landolt: 117 (1994).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stylochaeton Lepr.

Malaisse & Bamps: 69 (1994); Mayo *et al.*: 151 (1997); Mayo *et al.*: 52 (1998).

Stylochiton Schott; Brown: 187 (1901); Binns: 19 (1968); Mayo: 42 (1988).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Wolffia Horkel ex Schleid.

Wild: 29 (1961); Landolt: 366 (1986); Crawford & Landolt: 59 (1995).

Sthn trop. Afr. 2, Angola, Zimbabwe, Mozambique, and sthn Afr.

Wolffiella (Hegelm.) Hegelm.

Landolt: 164 (1984); Landolt: 335 (1986); Landolt: 117 (1994).

Pseudowolffia Hartog & Plas; Hepper: 7 (1973). *Wolffiopsis* Hartog & Plas; Hepper: 7 (1973).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Zamioculcas Schott

Binns: 19 (1968); Mayo: 15 (1985); Mayo *et al.*: 146 (1997); Mayo *et al.*: 51 (1998); Bogner: 230 (2001); Mapaura & Timberlake: 162 (2002).

Monotypic genus: *Zamioculcas zamiifolia* (Lodd.) Engl.; sthn trop. Afr.: Zimbabwe, Malawi, Mozambique, and sthn Afr.

Zantedeschia Spreng.

Binns: 19 (1968); Letty: 8 (1973); Mayo: 36 (1985); Ntépé-Nyamè: 40 (1988); Yao *et al.*: 4 (1994); Singh *et al.*: 321 (1996); Mayo *et al.*: 232 (1997); Mayo *et al.*: 64 (1998).

Richardia Kunth; Brown: 167 (1901).

Sthn trop. Afr. 1: *Zantedeschia albomaculata* (Hook.) Baill., Angola, Zambia, Zimbabwe, Malawi, ?Mozambique, and sthn Afr.

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Arecaceae
(Palmae)
(Arecidae—Arecales)
(Commelinids—Arecales)

Glen, H.F. in Leistner: 580 (2000).

Expanded family description: Acaulescent perennials climbing with aid of slender, whip-like organs, often bearing recurved hooks, referred to as **cirri** (*singular*: **cirrus**), when formed as an extension of leaf rachis, or **flagella** (*singular*: **flagellum**), when they are a modified inflorescence arising on side of leaf sheath. **Flowers** sometimes bisexual, sometimes in pairs: 1 female + 1 sterile male flower or 2 female flowers.

Identification of additional genera: The two additional genera can be distinguished from all other sthn trop. Afr. genera by their habit: both are climbers usually bearing either flagellae and/or cirri. They can be distinguished from each other as follows:

Calamus: Leaves with a knee above the often spiny sheath, rachis not ending in a cirrus; flowers unisexual.

Eremospatha: Leaves not kneed above the sheath which is striate-veined and not spiny; rachis prolonged into an armed cirrus; flowers bisexual.

Sthn trop. Afr.: genera 6, species ?17.

Borassus L.

Burtt Davy *et al.*: 71 (1958); White: 11 (1962); Russell: 168 (1968); Dransfield: 18 (1986); Uhl & Dransfield: 222 (1987); Morris: 2 (1994); Aké Assi & Guinko: 773 (1996); Dransfield & Uhl: 335 (1998); White *et al.*: 56, 105 (2001); Coates Palgrave: 99 (2002); Mapaura & Timberlake: 162 (2002).

Widespread throughout the less dry areas of trop. Africa; sthn trop. Afr 1: *Borassus aethiopum* Mart., Zambia, Zimbabwe, Malawi, Mozambique, and introduced and probably naturalised in sthn Afr.

Calamus L.

Linnaeus: 325 (1753); Wright: 107 (1901); Russell: 166 (1968); Dransfield: 41(1986); Uhl & Dransfield: 255 (1987); Dransfield & Uhl: 342 (1998).

Acaulescent, climbing, dioecious, flowering each year when mature. **Leaves** pinnate, usually with a knee above sheath; sheath often bearing straight spines and sometimes a flagellum; rachis with sharp recurved hooks, not ending in a cirrus; leaflets many, with a single fold, with fine spines on margin and sometimes on lower surface. **Inflorescence** axillary; male branched to 3 orders; female to 2; outer sheathing bract strictly tubular, persistent; male flowers solitary; female flowers in pairs, or a female flower paired with a sterile male flower. **Male flowers**: calyx much shorter than corolla; stamens 6; anthers elongate, latrorse. **Female flowers** much larger than male ones; ovary with large, fleshy, recurved stigmas. **Fruit** 1–3-seeded, with 16–21 vertical rows of fimbriate scales. **Seed**: endosperm homogenous or ruminate; embryo basal or lateral.

Species ± 400, India and S China to Fiji and Australia, 1 in Africa: *Calamus deerratus* G.Mann & H.Wendl.; sthn trop. Afr.: Angola.

Eremospatha (G.Mann & H.Wendl.) H.Wendl.

Wendland: 244 (1878); Wright: 111 (1901); Gossweiler & Mendonça: 63, 66 (1939); Russell: 168 (1968); Dransfield: 33(1986); Uhl & Dransfield:

239 (1987); Dransfield & Uhl: 339 (1998).

Caespitose climbers, flowering each year when mature; stems long, slender, ringed. **Leaves** pinnate with ± 12–14 pairs of elliptic-ovate leaflets, without knee above sheath; rachis produced into a slender armed cirrus. **Inflorescence** branched to first order; flowers paired; bracts inconspicuous. **Flowers** bisexual. **Calyx** 3-lobed, campanulate. **Corolla** with 3 short lobes. **Stamens** 6, in a fleshy epipetalous ring; filaments short, broad, connate; anthers medifixed, latrorse. **Ovary** 3-locular; stigmas tongue-shaped. **Fruit** berry-like, 1–3-seeded, with sweet, fleshy mesocarp. **Seed** subbasally attached; embryo lateral.

Species 12 (but probably fewer), trop. Africa; sthn trop. Afr. 3, Angola, Zambia.

Hyphaene Gaertn.

Burtt Davy *et al.*: 73 (1958); White: 12 (1962); Furtado: 427 (1967) [not seen]; Dransfield: 21 (1986); Uhl & Dransfield: 228 (1987); Morris: 4 (1994); Dransfield & Uhl: 336 (1998); Coates Palgrave: 98 (2002).

Sthn trop. Afr. ?5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Phoenix L.

Dransfield: 14 (1986); Uhl & Dransfield: 214 (1987); Morris: 9 (1994); Dransfield & Uhl: 333 (1998); Barrow: 513 (2000); White *et al.*: 107 (2001); Coates Palgrave: 97 (2002).

Sthn trop. Afr. 1 indigenous: *Phoenix reclinata* Jacq., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.; 1 widely cultivated: **P. dactylifera* L., the Date palm.

Raphia P.Beauv.

Gossweiler & Mendonça: 56, 57, 101 (1939); Burtt Davy *et al.*: 73 (1958); White: 12 (1962); Russell: 161 (1968); Obermeyer & Strey: 29 (1969); Dransfield: 37 (1986); Uhl & Dransfield: 275 (1987); Morris: 7 (1994); Dransfield & Uhl: 344 (1998); White *et al.*: 107 (2001); Coates Palgrave: 100 (2002); Mapaura & Timberlake: 162 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Coates Palgrave (2002) thinks that the isolated colonies of *Raphia farinifera* (Gaertn.) Hyl. in Zimbabwe and Mozambique may be relics of a once much wider population.

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Asparagaceae
(in narrow sense)
(Liliidae—Asparagales)
(Monocots—Asparagales)

Meyer, N.L. in Leistner: 582 (2000).
Van Jaarsveld: 230 (2001).

Sthn trop. Afr.: genus 1, species ± 40.

Asparagus L.

Baker: 425 (1898); Engler & Gilg: 196 (1903); Obermeyer & Immelman: 11 (1992); Malcomber & Sebsebe Demissew: 63 (1994); Lebrun & Stork: 60 (1995); Kubitzki & Rudall: 128 (1998); White *et al.*: 93 (2001); Mapaura (Unpublished).

Myrsiphyllum Willd.; Obermeyer: 71 (1992). *Protasparagus* Oberm.; Mathew: 181 (1989).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Asphodelaceae
(including Aloaceae)
(Liliidae—Asparagales)
(Monocots—Asparagales)

Compiled by G.F. Smith

Smith, G.F. & Meyer, N.L. in Leistner: 582 (2000). See also: Smith & Newton: 102 (2001); Treutlein *et al.*: 193 (2003).

Amended family notes: Genera 14 [the monotypic *Poellnitzia* has been subsumed under *Astroloba*—see Manning & Smith: 53 (2000)], species ± 780; sthn trop. Afr.: genera 8, species ± 70.

Identification of additional genus using the key in the above reference by Smith & Meyer: **Jodrellia** keys out to *Bulbine*, but filaments are bearded only towards their apex, and the perianth consists of 2 types of tepals: the inner 1-nerved, the outer 3-nerved and wider than the inner ones.

Aloe L.

Reynolds: 1 (1954); West: 1 (1974); Carter: 53 (2001); Newton: 103 (2001); Coates Palgrave: 102 (2002); Mapaura & Timberlake: 161 (2002); Msekandiana & Mlangeni: 34 (2002).

Sthn trop. Afr. ± 55, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bulbine Wolf

Kativu: 41 (1996); Kativu: 39 (2001); Van Jaarsveld & Forster: 233 (2001).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chortolirion A.Berger

Carter: 51 (2001); Smith: 189 (2001).

Sthn trop. Afr. 1: *Chortolirion angolense* (Baker) A.Berger, Angola, Zimbabwe, and sthn Afr.

Gasteria Duval

Van Jaarsveld: 33 (1994); Smith & Meyer: 585 (2000).

Sthn trop. Afr. 1: *Gasteria ?batesiana* G.D.Rowley, Mozambique, but genus largely confined to sthn Afr.

Haworthia Duval

Crouch *et al.*: 8 (1999); Carter: 48 (2001).

Sthn trop. Afr. 1: *Haworthia limifolia* Marloth var. *limifolia,* Mozambique, but genus largely confined to sthn Afr.

Jodrellia Baijnath

Baijnath: 571 (1978); Kativu: 51 (1996); Smith & Van Wyk: 137 (1998); Kativu: 46 (2001).

Succulent, perennial, acaulescent herbs; rootstock short; roots fusiform, fleshy, rootlets slender. **Leaves** rosulate, several to many, glabrous, outer ones scale-like and tubular at base, interior ones subterete, smaller. **Inflorescence** a many-flowered, compact raceme, shorter than leaves; peduncles 1–3 per plant, leafless, terete, glabrous; bracts white, translucent, 1-nerved. **Flowers**: pedicels slender, patent to slightly recurved, not articulated, shorter to longer than bracts. **Perianth** stellate, free, caducous, white, inner ones 1-nerved, outer ones wider, 3-nerved. **Stamens** 3 + 3, erect, free, shorter than tepals; filaments with long hairs massed towards apical end. **Ovary** 3-locular; ovules few per locule; style terete, slender; stigma papillose. **Capsule** obovoid, inflated or not, 3-lobed, usually loculicidal. **Seeds** 1–3 per locule, deltoid, slightly winged, black.

Species 2 or 3, trop. Africa; sthn trop. Afr. 1: *Jodrellia fistulosa* (Chiov.) Baijnath, Zambia, Zimbabwe, Malawi.

Kniphofia Moench

Marais: 465 (1974); Kativu: 28 (1996); Kativu: 26 (2001); Msekandiana & Mlangeni: 34 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Trachyandra Kunth

Kativu: 34 (1996); Kativu: 33 (2001).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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SMITH, G.F. & NEWTON, L.E. 2001. Aloaceae. In: U. Eggli (ed.), *Handbook of succulent plants*. Monocotyledons: 102–103. Springer-Verlag, Berlin.

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Behniaceae

(Liliidae—Asparagales)
(Monocots—Asparagales; under Agavaceae)

Dioecious, scandent climbers or subshrubs from short rhizomes. **Leaves** alternate, distichous, very shortly petiolate, without sheathing base; blades ovate with many parallel veins and many cross-veins, midrib prominent. **Inflorescence** an axillary helicoid cyme or flowers borne singly. **Flowers** regular, small, either functionally female or functionally male; pedicels articulated. **Perianth** marcescent, not twisted after anthesis; tepals 3 + 3, forming a short broad tube with lobes subequal, spreading, white or pale green. **Stamens** 3 + 3, arising from lower half of perianth tube, ± reaching mouth of tube; anthers 2-thecous, introrse, dehiscing by longitudinal slits. **Ovary** superior, 3-locular and 3-carpellate; style simple, trigonous; stigma apical, tripartite; ovules few per locule, anatropous, in 2 rows on axile placentas. **Fruit** a berry with a short basal stipe, white. **Seeds** 3–15, angular, yellow to brown, drying blackish brown; embryo clavate; endosperm copious, without starch.

Genus 1, species 1, sthn trop. and sthn Afr.

Meyer, N.L. in Leistner: 643 (2000) under Luzuriagaceae.

Behnia Didr.

Dahlgren *et al.*: 135 (1985) under Luzuriagaceae; Obermeyer: 83 (1992) under Luzuriagaceae; Conran *et al.*: 996 (1997); Reveal: 273 (1997); Conran: 148 (1998); Conran: 115 (1999); White *et al.*: 108 (2001) under Philesiaceae; Mapaura (Unpublished).

Description as for family.

Monotypic genus: *Behnia reticulata* (Thunb.) Didr.; sthn trop. Afr.: Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Burmanniaceae

(Liliidae—Liliales)
(Monocots—Dioscoreales)

Archer, C. in Leistner: 587 (2000).

Additional family references: Jonker: 1 (1938); Dahlgren *et al.*: 216 (1985); Maas-van de Kamer: 154 (1998).

Sthn trop. Afr.: genera 2, species ?3.

Additional family characters: Rhizome with clusters of tuberous bulbils. **Leaves** cauline, alternate. **Flowers** irregular; perianth urn-shaped. **Stamens** 6; anther connective attached to funnel-shaped stigma. **Ovary** 1-locular with 3 parietal placentas basally connate. **Ovary**: wall together with perianth deciduous, leaving placenta column with seeds.

Identification of additional genus: **Afrothismia** can be distinguished from **Burmannia** by cauline leaves, and irregular, urn-shaped flowers in which the anther connective is attached to the funnel-shaped stigma.

Afrothismia (Engl.) Schltr.

Schlechter: 138 (1906); Jonker: 222 (1938); Hepper: 180 (1968); Cowley: 6 (1988); Maas-van de Kamer: 154 (1998); Brummitt (Unpublished).

Small, fleshy, saprophytic perennial herbs, usually with a single stem; rhizome cylindric, each node with clusters of tuberous bulbils, each with a filamentous root. **Leaves** alternate, cauline, small, scale-like, sparse. **Flowers** irregular, relatively large, in a simple or bifurcate, 1–4-flowered cincinnus. **Perianth**: urn-shaped, with internal flange ± at middle, and an annulus in throat; lobes subequal. **Stamens** 6, arising in lower part of floral tube; filaments fused to tube below flange, upper part incurved; anthers hanging, connective attached to stigma, thecae dehiscing longitudinally. **Ovary** 1-locular, with 3 parietal placentas, basally connate into a central sterile column, apically free and fertile; ovules anatropous, ellipsoid; stigma funnel-shaped. **Fruit**: ovary wall and perianth deciduous after flowering, leaving placenta column with numerous ellipsoid seeds around apex.

Species ± 4, trop. Africa, rare, in mountain forest; sthn trop. Afr. ?1: *Afrothismia ?winkleri* (Engl.) Schltr. Malawi.

Burmannia L.

Jonker: 57 (1938); Binns: 24 (1968); Hepper: 179 (1968); Obermeyer: t. 1427 (1964); Geerinck: 3 (1970); Hilliard & Burtt: 253 (1976); Cowley: 1 (1988); Maas-van de Kamer: 161 (1998).

Sthn trop. Afr. 2: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Colchicaceae
(Liliidae—Liliales)
(Monocots—Liliales)

Meyer, N.L. in Leistner: 587 (2000).

Sthn trop. Afr.: genera 7, species 10.

Androcymbium Willd.

Baker: 559 (1898); Krause: 270 (1930); Nordenstam: 182 (1998); Phiri (Unpublished).

Sthn trop. Afr. 2: Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Camptorrhiza E.Phillips

Phillips: t. 575 (1935); Obermeyer: 86 (1961); Nordenstam: 183 (1998).

Species 2, Africa and India; sthn trop. Afr. 1: *Camptorrhiza strumosa* (Baker) Oberm., Zimbabwe, Mozambique, and sthn Afr.

Gloriosa L.

Baker: 563 (1898); Krause: 266 (1930); Hepper: 106 (1968); Nordenstam: 183 (1998); Bingham & Smith: 140 (2002).

Species probably only 1, very variable: *Gloriosa superba* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Iphigenia Kunth

Baker: 561 (1898); Obermeyer: 84 (1961); Nordenstam: 183 (1998).

Sthn trop. Afr. 1: *Iphigenia bechuanica* Baker, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Littonia Hook.

Baker: 565 (1898); Krause: 266 (1930); Nordenstam: 183 (1998); Phiri (Unpublished).

Sthn trop. Afr. 2: *Littonia littonioides* (Welw. ex Baker) K.Krause (=*Sandersonia littonioides* Welw. ex Baker), *L. lindenii* Baker, Angola, Zambia, and sthn Afr.

Ornithoglossum Salisb.

Nordenstam: 1 (1982); Nordenstam: 183 (1998).

Sthn trop. Afr. 2: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Wurmbea Thunb.

Hepper: 107 (1968); Nordenstam: 211 (1978); Nordenstam: 182 (1998).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, and sthn Afr.

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Commelinaceae
(Commelinidae—Commelinales)
(Commelinids—Commelinales)

Fish, L. in Leistner: 591 (2000).

Sthn trop. Afr.: genera 11, species ± 86.

Key to genera

1a Fertile stamens 6(5):
2a Filaments bearded; flowers usually ± regular:
3a Plants glandular-pubescent; petals yellow; only known from Zimbabwe ..... **Triceratella**
3b Plants glabrous or variously hirsute but not glandular; petals blue, pink or white:
4a Inflorescences all axillary, perforating the subtending leaf sheath ..... **Coleotrype**
4b Inflorescences terminal, or terminal and axillary, not perforating the leaf sheath ..... **Cyanotis**
2b Filaments glabrous:
5a Petals fused into a tube towards the base; inflorescences perforating the subtending leaf ..... **Coleotrype**
5b Petals free; inflorescences not perforating the subtending leaf:
6a Fruit indehiscent, hard, shiny metallic blue ..... **Pollia**
6b Fruit a 2- or 3-valved capsule:
7a Flowers irregular; capsule with 2, 1-seeded locules ..... **Floscopa**
7b Flowers regular; capsule with 3, 2–10-seeded locules ..... **Stanfieldiella**
1b Fertile stamens 3; filaments bearded or glabrous:
8a Inflorescences subtended by a leaf-like or bract-like spathe; staminodes typically with 4(–6)-lobed antherodes ..... **Commelina**
8b Inflorescences not enclosed in a spathe; staminodes, if present, with 2- or 3-lobed antherodes:
9a Fruit indehiscent, a ± fleshy berry with 3 locules, each with 2 or 3 seeds ..... **Palisota**
9b Fruit a (2- or)3-locular capsule:
10a Petals unequal, the anterior (lower) one smaller than the others; capsule 2-locular or unequally 3-locular ..... **Aneilema**
10b Petals equal:
11a Main stem very short; inflorescences ± scapose; filaments glabrous; antherodes not lobed ..... **Anthericopsis**
11b Main stem usually well-developed, bearing terminal and/or lateral cincinni; all filaments usually bearded; antherodes 3-lobed or hastate ..... **Murdannia**

Aneilema R.Br.

Faden: 1 (1991); Faden: 126 (1998).

Sthn trop. Afr. ± 30, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anthericopsis Engl.

Engler: 139 (1895); Clarke: 75 (1901); Brenan: 365 (1966); Faden: 83 (1995).

Perennial, completely glabrous herbs, dormant in dry season; tubers at ends of thin wiry roots. **Leaves** spirally arranged, all or mostly in a basal rosette, sessile. **Inflorescence** sometimes subsessile at first flowering, eventually long-pedunculate, scapose or subscapose, terminal and axillary, composed of 1 or 2 sessile, contracted, bracteolate cincinni arranged umbel-like at summit of scape. **Flowers** bisexual, regular, pedicelled. **Sepals** 3, free, equal, sepaline. **Petals** 3, free, equal, not clawed. **Stamens** 3, antesepalous, free, equal; filaments glabrous; staminodes 3, antepetalous, free; antherodes small, unlobed. **Ovary** 3-locular, 3-valved; ovules many. **Fruit** a 3-valved capsule. **Seeds** 8–12 per locule, uniseriate, hilum linear; embryotega semilateral. $x = 7$.

Monotypic: *Anthericopsis sepalosa* (C.B.Clarke) Engl. (=*Aneilema sepalosa*

C.B.Clarke; *Gillettia sepalosa* (C.B.Clarke) Rendle), eastern trop. Afr.; sthn trop. Afr.: Zambia, Malawi, Mozambique.

Coleotrype C.B.Clarke

Obermeyer & Faden: 49 (1985); Faden: 120 (1998).

Sthn trop. Afr. 1: *Coleotrype natalensis* C.B.Clarke, Zimbabwe, Mozambique, and sthn Afr.

Commelina L.

Clarke: 33 (1901); Brenan: 42 (1968); Faden: 126 (1998); Faden: 398 (2001).

Sthn trop. Afr. ± 26, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cyanotis D.Don

Clarke: 78 (1901); Brenan: 36 (1968); Obermeyer & Faden: 50 (1985); Faden: 120 (1998).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Floscopa Lour.

Clarke: 84 (1901); Brenan: 26 (1968); Faden: 124 (1998).

Sthn trop. Afr. ± 7, Angola, Zambia, Malawi, and sthn Afr.

Murdannia Royle

Brenan: 179 (1952); Binns: 28 (1968); Brenan: 24 (1968); Faden: 124 (1998).

Sthn trop. Afr. ± 4, Angola, Zambia, Mozambique, and sthn Afr.

Palisota Rchb. ex Endl.

Endlicher: 125 (1836), name conserved; Clarke: 27 (1901); Brenan: 33 (1968); Faden: 119 (1998).

Perennial herbs, generally medium- to large-sized, with a distinct aerial main stem or with rosettes of leaves at ground level. **Leaves** spirally arranged or in pseudowhorls, petiolate. **Inflorescence** thyrsiform, pedunculate, terminal and/or axillary. **Flowers** bisexual and male, slightly irregular, pedicellate. **Sepals** 3, subequal. **Petals** 3, free, subequal. **Stamens** 3, 2 posterior ones shorter and with sterile pollen, anterior stamen longer and with fertile pollen; staminodes 2 or 3, subequal or posterior one different or lacking. **Ovary** 3-locular; ovules 1–8 per locule; style short, glabrous. **Fruit** an indehiscent 3-locular berry, orange to red or blue to black.

Species ± 18, trop. Africa; sthn trop. Afr ± 4, Angola and Zambia.

Pollia Thunb.

Thunberg: 11 (1781); Clarke: 26 (1901); Brenan: 358, 359 (1966); Brenan: 32 (1968); Faden: 125 (1998).

Aclisia E.Mey.

Stoloniferous or rhizomatous perennial herbs; main stem monopodial, ± erect; roots fibrous. **Leaves** spirally arranged, petiolate. **Inflorescence** a terminal thyrse. **Flowers** regular to slightly irregular, pedicellate; bracts subtending pedicels scale-like, amplexicaul. **Sepals** 3, free, subequal, sepaline or petaline. **Petals** 3, free, equal or posterior 2 differing slightly from anterior one. **Stamens** 6, equal and fertile, or posterior 3 shorter than anterior 3, and either fertile or staminodial filaments free, glabrous. **Ovary** 3-locular. **Fruit** indehiscent, berry-like, 3-locular, hard and crustaceous, usually shiny metallic blue. **Seeds** usually 3–8 per locule, hilum ± punctiform, embryotega dorsal. $x = 5(?), 15, 16, 19(?)$.

Species 17, pantropical and warm temperate; sthn trop. Afr. 1: *Pollia condensata* C.B.Clarke, Angola.

Stanfieldiella Brenan

Brenan: 283 (1960); Brenan: 358 (1966); Brenan: 23 (1968); Faden: 124 (1998).

Bufforestia C.B.Clarke, in part.

Perennial herbs with monopodial, ± elongate stem; roots fibrous. **Leaves** spirally arranged, petiolate. **Inflorescence** terminal and/or axillary thyrses or reduced to a single cincinnus, never perforating leaf sheaths. **Flowers** bisexual, regular, pedicellate. **Sepals** 3, free, subequal, sepaline, usually glandular-pubescent. **Petals** 3, free, equal, not clawed. **Stamens** 6, subequal; filaments ± straight, glabrous. **Ovary** 3-locular. **Fruit** a 3-locular, 3-valved capsule. **Seeds** 2–10 per locule, 1-seriate, hilum linear, embryotega lateral. $x = 11, 12(?), 22$.

Species 4, trop. Africa; sthn trop. Afr 1: *Stanfieldiella imperforata* (C.B.Clarke) Brenan, Angola.

Triceratella Brenan

Brenan: 14 (1961); Faden & Hunt: 23 (1991); Faden: 118 (1998); Izidine & Bandeira: 50 (2002); Mapaura & Timberlake: 163 (2002).

Annual herbs, small, glandular-pubescent, resembling a small species of *Juncus*; main stem erect. **Leaves** spirally arranged, linear, sessile. **Inflorescences** single, leaf-opposed cincinni. **Flowers** bisexual, ± regular, subsessile. **Sepals** 3, free, subsessile, longer than petals, glandular-pubescent. **Petals** 3, free, subequal, not clawed, yellow. **Stamens** 6, equal or subequal; filaments pubescent; anthers with a narrow connective, opening lengthwise. **Ovary** 3-locular, sessile, glabrous; style filiform, short, glabrous; stigma capitate; ovules biseriate, many in each locule. **Fruit** a 3-locular capsule; after dehiscence the 3 valves curve outwards and resemble 3 small horns. **Seeds** many, biseriate, ± hemispherical, exarillate, hilum punctiform, embryotega dorsal.

Monotypic: *Triceratella drummondii* Brenan, Zimbabwe, Mozambique.

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Costaceae
(Zingiberidae—Zingiberales)
(Commelinids—Zingiberales)

Perennial, rhizomatous, non-aromatic herbs; stems terete, usually unbranched, leafy. **Leaves** spirally arranged; sheaths closed, tubular; petiole short; pulvinus absent; lamina narrowly to broadly elliptic; ligule often encircling stem. **Inflorescence** usually a subglobose, cone-like spike, either on bracteate shoots arising from rhizome or terminating leafy shoots; bracts each subtending 1 or 2 flowers. **Flowers** bisexual, irregular, epigynous, large. **Calyx** tubular, with 3 apical teeth, sometimes split to base on one side. **Petals** 3, basal third and base of androecium (all except the 1 fertile stamen) fused into a tube; labellum broad, petaloid, ± 3-lobed, opposite stamen, curved into a funnel-shaped structure. **Stamen** 1 with subterminal, 2-thecate anther dehiscing introrsely by longitudinal slits. **Ovary** inferior, 3-locular; ovules many, anatropous; placentation axile; style filiform, passing between anther thecae and ending in a funnel-shaped stigma with a ciliate margin and a dorsal appendage; nectaries 2, septal, embedded in top of ovary. **Fruit** a berry, usually covered by bracts and crowned by persistent calyx. **Seeds** many, aril white to yellow; endosperm poorly developed; perisperm abundant. $x = 8$ or 9 (fide Takhtajan 1997).

Genera 4, species ± 100, pantropical, but mainly in Central and South America. Very close to, and formerly generally included in Zingiberaceae; sthn trop. Afr.: genus 1, species ± 4.

Schumann: 378 (1904) under Zingiberaceae; Loesener: 628 (1930); Koechlin: 62 (1964); Lock: 2 (1985) under Zingiberaceae; Takhtajan: 538 (1997); Larsen: 128 (1998).

Costus L.

Linnaeus: 2 (1753); Lock: 841 (1984); Lock: 2 (1985); Larsen: 128 (1998); Mapaura & Timberlake: 163 (2002).

Description as for family.

Species ± 90, ± 25 in trop. Africa; sthn trop. Afr. ± 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

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Cymodoceaceae
(Alismatidae—Najadales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 593 (2000). General reference: Macnae: 29 (1958).

Sthn trop. Afr.: genera 4, species 6.

Key to genera

1a Rhizome woody, with sympodial branching; stems elongated, arising on each 4th internode; leaves coriaceous, ± 10 mm broad; styles with 2–4 stigmatic branches; anthers subsessile, attached at same height ..... **Thalassodendron**

1b Rhizome herbaceous, monopodial with short stems and roots arising at the nodes; leaves grass-like; leaf sheath more persistent than blade; anthers stalked:

2a Leaves terete; flowers in inflorescences ..... **Syringodium**
2b Leaves flat; flowers solitary:
3a Leaves 3-veined; anthers connate at different levels; style undivided ..... **Halodule**
3b Leaves 7–17-veined; anthers connate at same level; style divided in 2 ..... **Cymodocea**

Cymodocea K.D.Koenig

Isaac: 32 (1968); Den Hartog: 160 (1970); Kuo & McComb: 138 (1998); Bandeira: 191 (2002); Beentje: 7 (2002).

Dioecious, submerged marine herbs; rhizome herbaceous, creeping, monopodially branched, with many vascular bundles, each node bearing 1–5 branched roots and a short erect stem bearing 2–7 leaves; squamules (small scales) 10 or more in 2 groups at each node. **Leaves**: blade linear, entire except for serrulate or spinulose distal part and ± toothed apex; nerves 7–17, with perpendicular cross-veins; sheath compressed, bi-auriculate, ligulate, persisting longer than blade, leaving an open or closed circular scar on stem. **Flowers** solitary and terminal, enclosed in a leaf similar to others; a bud in axil of penultimate leaf lengthening to give rise to a sympodium. **Male flowers** stalked, of 2 dorsally connate anthers attached at same level, each crowned by a subulate tip. **Female flowers** sessile or shortly stalked, of 2 free ovaries each with a short style, distally bifid. **Fruit** with a stony pericarp, smooth or somewhat warty with dorsal ridges and a beak, laterally compressed, semicircular to elliptic in outline.

Species 4, tropical to subtropical seas of Old World; sthn trop. Afr. 2, Mozambique, and sthn Afr.

Halodule Endl.

Isaac: 39 (1968); Den Hartog: 146 (1970); Kuo & McComb: 138 (1998); Bandeira: 191 (2002); Beentje: 5 (2002).

Sthn trop. Afr. 2, Mozambique, and sthn Afr.

Syringodium Kütz.

Kützing: No. 426 (1860); Isaac: 39 (1968); Den Hartog: 176 (1970); Kuo & McComb: 137 (1998); Beentje: 2 (2002).

Dioecious perennial marine herbs; rhizome monopodially branched, herbaceous, creeping, with 1 or more branched roots and short, erect, unbranched shoots at each node. **Leaves** 2 or 3 on each erect shoot; blade terete, with 1–several peripheral vascular bundles and several large air lacunae; leaf scars open, circular; leaf sheath open; 2 squamules (small scales) at each node. **Inflorescences** with bracts terminating erect shoots; branching racemose below, cymose above; male flowers with anthers at same level, dorsally fused in their lower parts; female flowers sessile; ovaries extending into a short style divided into 2 stout stigmatic lobes.

Species 2, 1 in the Indo-West Pacific, the other in the Caribbean; sthn trop. Afr. 1: *Syringodium isoetifolium* (Asch.) Dandy, Mozambique.

Thalassodendron Hartog

Den Hartog: 186 (1970); Kuo & McComb: 138 (1998); Glen: 593 (2000); Bandeira: 191 (2002); Beentje: 1 (2002).

Sthn trop. Afr. 1: *Thalassodendron ciliatum* (Forssk.) Hartog, Mozambique, and sthn Afr.

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Cyperaceae
(Commelinidae—Cyperales)
(Commelinids—Poales)

C. Archer in Leistner: 594 (2000).

Sthn trop. Afr.: genera 35, species ± 490.

Identification of additional genera using the key in the above reference:

Actinoschoenus runs to 2a in the *Key to groups and genera* because of its usually 1-flowered bisexual spikelets, but it will not run to *Group 1* because it has more than 1 empty glume or spikelet bract at the base of the spikelet. Continuing to 2b it will run to 3a because of its distichous glumes, and then to *Group 4*. Having no bristles it will run to 1b. **Actinoschoenus** generally differs from *Schoenus* and *Epischoenus* (which does not occur in sthn trop. Afr.) by its 1-flowered (not 2- or more-flowered) spikelets and the short rachilla internodes.

Diplacrum runs to *Group 6* as all florets are unisexual, and further to 4b. It differs from *Scleria* in that all its spikelets are

unisexual and the female spikelet is 1-flowered; it also differs from *Scleria* in having only 2, not 3 glumes below the female floret.

Hypolytrum runs to *Group 3* and therein to 14a. It can be distinguished from *Scirpus* [but genus no longer recognized in sthn trop. Afr.—see Lebrun & Stork: 206 (1995)] by its large leaves which have no ligule, and by its flowers subtended by 2 lateral, ± ciliate-keeled scales, each with a single stamen, and often ± fused with eaeh other.

Mapania, like *Hypolytrum* a member of the Mapanioideae, also runs to *Group 3* and therein to 14a. It can be distinguished in the same way from *Scirpus* [no longer recognised in sthn trop. Afr.] as *Hypolytrum* from which it can be distinguished by its 4–6 (not 2 or 3) lateral, ± ciliate-keeled hypogynous scales.

Nemum runs to *Group 3* and therein somewhat uncomfortably to 14, but it can be distinguished from both *Scirpus* [no longer recognized in sthn trop. Afr.] and *Isolepis* by the long hairs at the mouth of the leaf sheath. **Nemum** is closely related to *Bulbostylis*, and if it was not for the style base which is not enlarged, it would run straight to that genus.

Queenslandiella runs to *Group 2*: 1b, but it can be distinguished from *Pycreus* by its pronounced curry smell and its spikelets which fall as a unit, and from *Kyllinga* also by its spike-like, not capitate, inflorescences.

Sphaerocyperus runs to *Group 2*: 2b, *Cyperus*, from which it can be distinguished by its spikelets which have several sterile glumes below, not with each glume subtending a flower as in *Cyperus*.

Abildgaardia Vahl

Lye: 493 (1974b); Haines & Lye: 91 (1983); Lye: 233 (1983c); Goetghebeur & Coudijzer: 86 (1984); Goetghebeur & Coudijzer: 207 (1985); Lye: 39 (1987); Gordon-Gray: 19 (1995); Lye: 595 (1996); Goetghebeur: 167 (1998).

Bulbostylis Kunth in part; Binns: 44 (1968). *Fimbristylis* Vahl in part; Clarke: 411 (1901/1902); Gordon-Gray: 141 (1966); Binns: 46 (1968).

Sthn trop. Afr. ?4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Actinoschoenus Benth.

Bentham: 33 (1881); Raynal: 89 (1967); Goetghebeur: 174 (1998); Bingham & Smith: 150 (2002).

Tufted, erect, stoloniferous or rhizomatous perennials. **Culms** with basal nodes, triquetrous. **Leaves** ligulate; blade very short. **Inflorescence** terminal, with 2–4 sessile, erect-ascending spikelets subtended by a single short bract. **Spikelets** with 4–7 distichous, deciduous glumes, 1(2)-flowered; flower bisexual, subtended by penultimate larger glume. **Perianth** 0. **Stamens** 3. **Style** 3-fid; base thickened, deciduous. **Nutlet** trigono-ovoid, smooth to slightly reticulate.

Species 3 or 4, trop. Africa, Madagascar, Sri Lanka to Malesia; sthn trop. Afr. 1: *Actinoschoenus repens* J.Raynal, Zambia.

Alinula J.Raynal

Goetghebeur & Vorster: 457 (1988); Lye: 56 (1992); Goetghebeur: 171 (1998); Bingham & Smith: 150 (2002).

Aliniella J.Raynal: 157 (1973) not of Skvortsow; *Mariscus* Vahl in part; Raynal: 159 (1973).

Sthn trop. Afr. 3, Zambia, Malawi, Mozambique, and sthn Afr.

Ascolepis Nees ex Steud.

Raynal: 85 (1968); Raynal: 159 (1973); Goetghebeur: 269 (1980); Lye: 561 (1982); Haines & Lye: 302 (1983); Hooper: 605 (1983); Lye: 561 (1983a); Goetghebeur: 171 (1998).

Sthn trop. Afr. 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bolboschoenus (Asch.) Palla

Goetghebeur & Simpson: 172 (1991); Browning & Gordon-Gray: 380 (1992a); Smith: 101 (1995); Goetghebeur: 165 (1998); Browning *et al.*: 475 (1998).

Schoenoplectus Palla subgen. *Bolboschoenus* (Palla) Lye. *Scirpus* L. in part; Clarke: 446 (1901/1902); Binns: 47 (1968).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bulbostylis Kunth

Clarke: 427 (1901/1902); Goetghebeur & Coudijzer: 207 (1985); Lye: 595 (1996); Goetghebeur: 167 (1998).

Abildgaardia Vahl subgen. *Bulbostylis* (C.B.Clarke) Lye; Haines & Lye: 95 (1983).

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Carex L.

Clarke: 514 (1901/1902); Nelmes: 160 (1940); Hess: 350 (1953); Podlech: 120 (1961); Binns: 44 (1968); Lye: 244 (1983d); Goetghebeur: 187 (1998); Mapaura (Unpublished).

Sthn trop. Afr. ?22, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Carpha R.Br.

Browning & Guthrie: 148 (1994); Goetghebeur: 177 (1998).

Sthn trop. Afr. 3, Zimbabwe, ?Malawi, and sthn Afr.

Cladium P.Browne

Clarke: 484 (1901/1902); Haines & Lye: 323 (1983); Gordon-Gray: 44 (1995); Mapaura (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 1: *Cladium mariscus* (L.) Pohl, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Coleochloa Gilly

Nelmes: 373 (1953); Haines & Lye: 330 (1973); Haines & Lye: 361 (1983); Browning & Gordon-Gray: 7 (1992b); Kativu: 33 (1994); Goetghebeur: 183 (1998).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Costularia C.B.Clarke

Browning: 653 (1994); Browning & Gordon-Gray: 155 (1996a); Browning & Gordon-Gray: 250 (1996b); Goetghebeur: 178 (1998).

Tetraria P.Beauv. in part; Gordon-Gray: 187 (1995).

Sthn trop. Afr. 1: *Costularia natalensis* C.B.Clarke, Zimbabwe, Malawi, and sthn Afr.

Courtoisina Soják

Gordon-Gray: 209 (1995); Vorster: 271 (1996); Goetghebeur: 170 (1998); Phiri (Unpublished).

Courtoisia Nees; Clarke: 403 (1901/1902). *Cyperus* L. subgen. *Courtoisia* (Nees) Lye; Haines & Lye: 174 (1983).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cyperus L.

Rendle: 109 (1899); Wild: 24 (1961); Haynes & Lye: 145 (1983); Lye: 213 (1983b); Lye: 505 (1988); Browning & Gordon-Gray: 508 (1993); Goetghebeur: 170 (1998); Mapaura (Unpublished).

Anosporum Nees; Phiri (Unpublished); *Juncellus* C.B.Clarke; Clarke: 306 (1901/1902). *Mariscus* Vahl; Clarke: 377 (1901/1902); Lye: 37 (1992).

Sthn trop. Afr. ± 150, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Diplacrum R.Br.

Brown: 240 (1810); Clarke: 510 (1901/1902); Napper: 445 (1971); Napper: 346 (1972); Haynes & Lye: 360 (1983); Lisowski: 485 (1996); Goetghebeur: 184 (1998); Bingham (Unpublished); Phiri (Unpublished).

Small, weak, nearly glabrous annuals with minute root system; culms 30–150 mm long, leafy throughout, often purplish below. **Leaves** without ligule, linear, 20–40 mm long, narrowing abruptly and acuminate at tip, often with reddish brown dots; margin scabrous, especially near apex; sheath funnel-shaped. **Inflorescence** consisting of several shortly pedunculate to almost sessile axillary clusters of spikelets; clusters in lower leaf sheaths hardly protruding. **Spikelets** all unisexual, lanceolate, straw-coloured or greenish yellow; lateral spikelets usually male; terminal spikelets usually female. **Male spikelets** with few distichous, persistent glumes, each subtending a monandrous male flower. **Female spikelets** with 2 distichous, persistent glumes surrounding a single, apparently terminal female flower; pistil seated on a basal 3-lobed disc with lobes opposite the 3 main ribs; style 3-fid, style base not thickened. **Achene** subglobose to ovoid, bluntly apiculate, longitudinally ribbed, grey to blackish.

Species 7, pantropical; sthn trop. Afr. 1: *Diplacrum africanum* (Benth.) C.B.Cl., Zambia.

Eleocharis R.Br.

Clarke: 404 (1901/1902); Hess: 317 (1953); Goetghebeur: 166 (1998); Mapaura (Unpublished).

Heleocharis of many authors.

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ficinia Schrad.

Gordon-Gray: 81 (1995); Goetghebeur: 168 (1998); Muasya *et al.*: 132 (2000c); Mapaura (Unpublished).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Fimbristylis Vahl

Clarke: 411 (1901/1902); Binns: 46 (1968); Goetghebeur & Coudijzer: 65 (1984); Goetghebeur: 166 (1998); Mapaura (Unpublished).

Scirpus L. in part; Binns: 47 (1968).

Sthn trop. Afr. ± 25, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Fuirena Rottb.

Clarke: 461 (1901/1902); Binns: 46 (1968); Lye: 109 (1974a); Lye: 241 (1983d); Goetghebeur: 168 (1998); Muasya: 187 (1998); Mapaura (Unpublished).

Sthn trop. Afr. ± 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hypolytrum Rich.

Richard: 70 (1805); Clarke: 486 (1901/1902); Nelmes: 522 (1954); Nelmes: 63 (1955a); Raynal: 423 (1968); Hooper: 335 (1972b); Goetghebeur: 160 (1998).

Perennials, rhizomatous. **Culm** usually with basal nodes or more rarely with several aerial nodes. **Leaves** eligulate, sometimes pseudopetiolate; basal leaves sometimes reduced to sheaths; cauline ones linear-lanceolate to narrowly elliptical. **Inflorescence** paniculate, corymbose or capitate, with many (rarely 1) spikelets; primary bracts from small and scale-like to large and leaf-like. **Spikelets** with many, spirally arranged, persistent glumes, each subtending a flower. **Flowers** bisexual; scales 2(3), basal pair lateral, ± ciliate-keeled, each with a single stamen, scales often connate or ± fused. **Style** 2-fid, style base ± persistent. **Nutlet** (ob-)ovoid to ellipsoid, smooth to tuberculate.

Species ± 40, pantropical, mainly equatorial, in forest; sthn trop. Afr. 5: Angola.

Isolepis R.Br.

Haines & Lye: 479 (1971); Raynal: 49 (1977); Haines & Lye: 133 (1983); Lye: 565 (1983a); Goetghebeur & Simpson: 173 (1991); Browning & Gordon-Gray: 510 (1993); Gordon-Gray: 104 (1995); Goetghebeur: 168

(1998); Muasya & Simpson: 257 (2002).

Eleogiton Link; Goodier & Phipps: 50 (1961). *Scirpus* L. in part; Clarke: 446 (1901/1902); Binns: 47 (1968).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Kyllinga Rottb.

Rendle: 103 (1899); Clarke: 268 (1901/1902); Binns: 46 (1968); Lye: 741 (1981b); Getliffe: 261 (1983); Mtotomwema: 637 (1990); Goetghebeur: 172 (1998), Mapaura (Unpublished).

Sthn trop. Afr. ± 30. Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Kyllingiella R.W.Haines & Lye

Haines & Lye: 175 (1978); Haines & Lye: 142 (1983); Goetghebeur: 169 (1998); Muasya: 997 (2002).

Scirpus L. in part; Clarke: 446 (1901/1902); Binns: 47 (1968).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, and sthn Afr.

Lipocarpha R.Br.

Haines & Lye: 473 (1971); Haines & Lye: 294 (1983); Hooper: 423 (1986a); Goetghebeur & Van den Borre: 1 (1989); Goetghebeur: 172 (1998).

Scirpus L.; Clarke: 446 (1901/1902); Raynal: 85 (1968); *Rikliella* J.Raynal: 154 (1973).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mapania Aubl.

Aublet: 47, t. 17 (1775); Clarke: 489 (1901/1902); Simpson: 1 (1992); Goetghebeur: 160 (1998).

Rhizomatous or stoloniferous perennials; roots thick, sometimes stilt-like on ascending rhizomes; culms central or lateral, (sub)scapose; lateral culms few to many, with several basal leaves reduced to a sheath. **Leaves** eligulate, sometimes pseudopetiolate, rarely all leaves reduced to a sheath. **Inflorescence** capitate, corymbiform, subanthelate or paniculate, when on lateral culms often reduced to 1–few spikelets; primary bracts small (on most lateral culms). **Spikelets** with few to many spirally arranged persistent glumes, each subtending a flower. **Flowers** bisexual; scales 4–6, basal pair lateral, ± ciliate-keeled, each with a single stamen, of the remaining 2–4 scales 0–2 with 1 stamen, very rarely only 1 stamen per flower. **Style** 2- or 3-fid, base not distinct, not or slightly thickened, persistent or not. **Achene** thick-lenticular or rounded-trigonous, sometimes 3-ribbed, sometimes with a fleshy exocarp; endocarp stony; embryo of *Carex*-type.

Species ± 70, pantropical, mainly equatorial; in tropical rainforest and along open swamps; sthn trop. Afr. 4, only in Angola (Cabinda).

Nemum Desf. ex Ham.

Hamilton: 13 (1825); Lye: 328 (1973); Raynal: 146 (1973); Haines & Lye: 130 (1983); Goetghebeur: 167 (1998).

Scirpus L. in part; Clarke: 446 (1901/1902).

Annuals, or tufted to creeping, rhizomatous perennials. **Culms** with basal nodes. **Leaves** ± clearly distichous, ligulate (in most perennials) or eligulate (all annuals), with long pale hairs at mouth of leaf sheath. **Inflorescence** a compound anthela or capitate or reduced to 1 or a few spikelets; primary bracts 1–few, small, not sheathing, often stiffly erect. **Spikelets** with many densely spirally arranged persistent glumes, each subtending a bisexual floret, dark brown to almost black. **Perianth** 0. **Stamens** 1–3. **Style**: base thickened, 2(3)-branched, deciduous. **Nutlet** obovoid, smooth, often shiny black, without persistent style base.

Species ± 5, trop. Africa; sthn trop. Afr. 2, Angola, Zambia.

Oxycaryum Nees

Lye: 280 (1971); Haines & Lye: 144 (1983); Gordon-Gray: 137 (1995); Goetghebeur: 169 (1998).

Scirpus L. in part; Clarke: 446 (1901/1902).

Monotypic: *Oxycaryum cubense* (Poeppich & Kunth) Lye, sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Pycreus P.Beauv.

Nelmes: 91 (1955b); Hooper & Raynal: 313 (1969); Lye: 617 (1981a); Haines & Lye: 268 (1983); Hooper: 782 (1985); Goetghebeur: 172 (1998).

Sthn trop. Afr. ± 30, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Queenslandiella Domin

Domin: 415 (1915); Ballard: t. 3208 (1933); Lye: 48 (1992); Goetghebeur: 172 (1998).

*Mariscop*sis Chermezon; Ballard: 457 (1932). *Cyperus* L. subgen. *Queenslandiella* (Domin) Govind.: 194 (1975); Haines & Lye: 292 (1983).

Tufted annuals with scent of curry. **Culms** scapose, with basal nodes. **Leaves** many, long, eligulate. **Inflorescence** anthelate; primary bracts 3–6, leaf-like, not sheathing; partial inflorescences spike-like, with few to many spikelets; spikelets deciduous as a unit, with few to several distichous, persistent glumes, each subtending a bisexual flower; rachilla internodes elongated. **Perianth** 0. **Stamens** 2. **Style** 2-fid, base not distinct. **Nutlet** suborbicular, flattened, brown to dark grey, minutely papillose.

Monotypic: *Queenslandiella hyalina* (Vahl) Ballard, East Africa, Madagascar, India, Sri Lanka, Malesia to NE Australia; sthn trop. Afr.: Mozambique.

Rhynchospora Vahl

Robinson: 32 (1961); Raynal: 135 (1971); Haines & Lye: 312 (1983); Goetghebeur: 174 (1998).

Scirpus L. in part; Clarke: 446 (1901/1902); Binns: 47 (1968).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schoenoplectus (Rchb.) Palla

Raynal: 119 (1976); Haines & Lye: 52 (1983); Lye: 242 (1983d); Browning *et al.*: 169 (1994); Goetghebeur: 165 (1998).

Scirpus L. in part; Clarke: 446 (1901/1902); Binns: 47 (1968).

Sthn trop. Afr. ± 15, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schoenoxiphium Nees

Binns: 47 (1968); Haines & Lye: 366 (1983); Kukkonen: 819 (1983); Goetghebeur: 186 (1998); Mapaura (Unpublished).

Sthn trop. Afr. 4, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schoenus L.

Clarke: 483 (1901/1902); Kükenthal: 5 (1938); Gordon-Gray: 171 (1995); Lye: 145 (1995); Goetghebeur: 175 (1998); Mapaura (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 1: *Schoenus nigricans* L., Zambia, Zimbabwe, Mozambique, and sthn Afr.

(Scirpus L.)

According to Goetghebeur: 162 (1998) this genus does not occur in Africa. Sthn trop. African species originally assigned to this genus have now been placed in *Abildgaardia, Bolboschoenus, Cyperus (=Mariscus), Eleocharis, Isolepis, Kylingiella, Lipocarpha, Nemum, Oxycarium, Rhynchospora, Schoenoplectus* and *Websteria* (Lebrun & Stork: 206 (1995). For phylogenetic relationships see Muasya *et al.*: 610 (2000b).

Scleria P.J.Bergius

Robinson: 487 (1966); Haines & Lye: 327 (1983); Lye: 243 (1983d); Goetghebeur: 184 (1998).

Sthn trop. Afr. ± 60, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sphaerocyperus Lye

Lye: 214 (1972); Haines & Lye: 293 (1983); Browning & Gordon-Gray: 507 (1993); Goetghebeur: 171 (1998).

Perennials, stout; rhizome creeping, scale-covered. **Culms** scapose, rigid. **Leaves** eligulate, lower leaves reduced to sheaths. **Inflorescence** capitate, whitish, with 1–several indistinct dense spikes of many spikelets; primary bracts 2 or 3, leaf-like, spreading to reflexed. **Spikelets** with several distichous, persistent glumes of increasing length, largest penultimate glume subtending a bisexual flower; spikelet deciduous as a unit. **Perianth** 0. **Stamens** 3; anthers linear. **Style** very long, 3-fid, base not distinct, not or only slightly thickened, persistent. **Nutlet** narrowly obovate, beaked, densely punctulate.

Monotypic: *Sphaerocyperus erinaceus* (Ridl.) Lye, trop. Africa; sthn trop. Afr.: Angola, Zambia.

Tetraria P.Beauv.

Raynal: 213 (1972); Haines & Lye: 320 (1983); Goetghebeur: 177 (1998); Msekandiana & Mlangeni: 35 (2002).

Sthn trop. Afr. 1: *Tetraria mlanjensis* J.Raynal, ?Zimbabwe, Malawi, and mainly in sthn Afr.

Volkiella Merxm. & Czech

Merxmüller & Czech: 317 (1953); Hooper: 945 (1986b); Goetghebeur: 172 (1998); Bingham & Smith: 151 (2002).

Monotypic genus: *Volkiella disticha* Merxm. & Czech, N Namibia and Zambia, ?Zimbabwe.

Websteria S.H.Wright

Hooper: 582 (1972a); Eiten: 181 (1976); Goetghebeur: 166 (1998).

Monotypic: *Websteria confervoides* (Poir.) S.S.Hooper, sthn trop. Afr.: Zambia, and sthn Afr.

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Dioscoreaceae

(Liliidae—Dioscoreales)
(Monocots—Dioscoreales)

Archer, R.H. in Leistner: 605 (2000). General family references: Huber: 216 (1998); Caddick *et al.*: 103 (2002).

Sthn trop. Afr.: genus 1, species ± 21.

Dioscorea L.

Rendle: 36 (1899); Milne-Redhead: 1 (1975); N'kounkou *et al.*: 139 (1993); N'kounkou: 595 (1996); Wilkin: 1 (1999a); Wilkin: 19 (1999b); Caddick *et al.*: 475 (2000); Schols *et al.*: 295 (2001); White *et al.*: 95 (2001); Wilkin: 361 (2001).

Sthn trop. Afr. ± 21, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Dracaenaceae
(Liliidae—Asparagales)
(Monocots—Asparagales; as optional synonym of Asparagaceae)

Archer, R.H. in Leistner: 606 (2000). General family references: Yamashita & Tamura: 387 (2000) under Convallariaceae; Angiosperm Phylogeny Group: 429 (2003).

Sthn trop. Afr.: genera 2, species ± 20.

Dracaena L.

White: 15, 431 (1962); Bos: 1 (1984); Bos: 1 (1992); Bos *et al.*: 311 (1992); Bos: 240 (1998); White *et al.*: 98 (2001); Coates Palgrave: 115 (2002).

Sthn trop. Afr. ± 8, Angola, Zambia, Mozambique, and sthn Afr.

Sansevieria Thunb.

Brown: 185 (1915); Russell: 113 (1982); Percy-Lancester & Richards: 70 (1992); Obermeyer: 5 (1992); Bos: 240 (1998) under *Dracaena*.

Sthn trop Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Eriocaulaceae
(Commelinidae—Eriocaulales)
(Commelinids—Poales)

Glen, R.P. in Leistner: 607 (2000). General family reference: Giuliatti *et al.*: 580 (2000).

Sthn trop. Afr.: genera 4, species 64.

Key to genera

[after Phillips (1998a)]

1a Stamens 6 or 4, twice as many as petals; petals usually with a black gland near or at the tip:
  2a Petals of female flowers free; leaves, scapes and sheaths usually glabrous ..... **Eriocaulon**
  2b Petals of female flowers connate into a tube, only the bases free; leaves, scapes and sheaths usually hairy ..... **Mesanthemum**
1b Stamens 3, as many as petals; petals usually eglandular:
  3a Petals of female flowers connate in the middle, the bases and tips free; leaves, scapes and sheaths usually hairy and often glandular ... **Syngonanthus**
  3b Petals of female flowers free; scapes, leaves and sheaths hairy or glabrous:
    4a Leaves, scapes and sheaths glabrous (except *E. mbalensis* S.M.Phillips); petals of male flowers with distinct free lobes ..... **Eriocaulon**
    4b Leaves, scapes and sheaths hairy; petals of male flowers connate into a truncate tube lacking free lobes ..... **Paepalanthus**

Eriocaulon L.

Rendle: 95 (1899); Hess: 123 (1955); Hess: 83 (1957); Phillips: 625 (1996); Phillips: 11 (1998a); Stützel: 204 (1998).

Sthn trop. Afr. 48, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mesanthemum Körn.

Körnicke: 572 (1856); Hess: 178 (1955); Meikle: 64 (1968); Cook: 87 (1990); Phillips: 32 (1997); Phillips: 49 (1998a); Stützel: 205 (1998).

Tufted perennial herbs of medium size, in marshes, or totally submersed aquatics; rhizome vertical to horizontal, short in aquatic species. **Leaves** in rosettes, linear, spongy or very thin (in the aquatic *Mesanthemum reductum* Hess). **Capitula** 1–several per plant; scapes ± erect, hairy or glabrous; surrounded by a closed sheath below, longer than leaves; involucral bracts in several imbricate series, coriaceous with scarious margins; floral bracts present or absent; receptacle densely hairy. **Male flowers** with sepals (if present) basally connate or free, usually membranous; petals 3, fused into a fleshy or hyaline tube, epipetalous glands 3 or absent; stamens 6, anthers 2-thecous;

vestigial gynoecium present or absent. **Female flowers** with sepals (if present) free; petals 3, free around the ovary but fused into a narrow cylindrical tube ending in 3 short, rounded lobes; epipetalous glands present or absent; ovary 3-locular; ovule 1 per locule, pendulous; style filiform; stigmas 3, ± as long as style. **Capsule** 3-locular. **Seeds** 3 per capsule, ellipsoid, brown.

Species17, trop. Africa and Madagascar; sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Paepalanthus Kunth

Kunth: 498 (1841), conserved name; Kimpouni: 71 (1993); Phillips: 39 (1997); Phillips: 65 (1998a).

Annual or perennial herbs; stem short or elongate. **Leaves** spirally arranged, narrow, thin to thick and coriaceous. **Capitula** single or in umbels, villous; floral bracts present; flowers 2- or 3-merous; petals eglandular. **Male flowers**: sepals free except at extreme base; petals connate into a glabrous infundibular tube bearing stamens on its truncate upper margin; petal tube finally involute and enclosing stamens; rudimentary pistil present; stamens as many as petals, white. **Female flowers**: sepals free except at extreme base, and usually becoming rigid at maturity; petals free; style with simple or bifid glandular appendages alternating with stigmas. **Seeds** variable, often with longitudinal ridges.

Species ± 500, almost entirely confined to tropical America, 2 in Africa; sthn trop. Afr. 1: *Paepalanthus lamarckii* Kunth, Zambia.

Syngonanthus Ruhland

Hess: 185 (1955); Kimpouni *et al.*: 567 (1994); Phillips: 34 (1997); Phillips: 55 (1998a); Phillips: 491 (1998b); Stützel: 205 (1998).

Paepalanthus Mart. in part; Rendle: 102 (1899).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

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Eriospermaceae

(Liliidae—Asparagales)

(Monocots—Asparagales; as optional synonym of Asparagaceae)

Meyer, N.L. in Leistner: 607 (2000). See also: Perry & Rudall: 241 (1998); Stedje: 414 (2000); Angiosperm Phylogeny Group: 429 (2003).

Eriospermum Jacq. ex Willd.

Perry: 1 (1994); Whitehouse: 1 (1996); Manning: 157 (2000) under Convallariaceae; Thiede: 76 (2002).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and mainly sthn Afr.

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Flagellariaceae
(Commelinidae—Restionales)
(Commelinids—Poales)

Archer, C. in Leistner: 608 (2000).

Sthn trop. Afr.: genus 1, species 2.

Flagellaria L.

Brown: 90 (1902); Napper: 1 (1971); Villiers: 75 (1984); Appel & Bayer: 210 (1998).

Sthn trop. Afr. 2: Angola, Mozambique, and sthn Afr.

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Hemerocallidaceae
(Liliidae—Asparagales; under Phormiaceae)
(Monocots—Asparagales)

Herbaceous to shrub-like, glabrous perennials; stem erect, usually unbranched; rhizome horizontal, sparsely branched. **Leaves** basal, scattered along stem or in a terminal rosette, sheathing at base and ± equitant, with sides of lamina becoming closely pressed together to form an isobilateral portion, midrib conspicuous, usually with minute serrations or prickles on lower surface. **Inflorescence** a loose panicle, terminal and exceeding leaves; bracts small; pedicels solitary or few, usually in axils of bracts, articulated immediately below flower. **Flowers** bisexual, regular. **Perianth** 3 + 3, lobes free, subequal, spreading, 3–7-nerved. **Stamens** 3 + 3, arising on receptacle; filaments filiform with a swelling (struma) below anther; anther basifixed, dehiscing extrorsely by pores becoming slits. **Ovary** superior, 3-locular, globose; ovules 4–8 in each locule, anatropous; placentation axile; style filiform, simple, minutely capitate. **Fruit** a berry, usually shiny blue. **Seeds** brown to black. $x = 8$ (fide Takhtajan 1997).

Genera 7, species 30, mainly in SE Asia and on Pacific islands, including New Zealand. Sthn trop. Afr.: 1 genus, 1 species.

Dahlgren *et al.*: 172 (1985); Takhtajan: 508, 512 (1997) under Dianellaceae: Clifford *et al.*: 251 (1998); Zimudzi & Pope: 99 (2001).

Dianella Lam.

Lamarck: 276 (1786); Wild: 251 (1953); Jessop: 206 (1979); Henderson: 194 (1987); Zimudzi & Pope: 99 (2001); Mapaura & Timberlake: 168 (2002) under Phormiaceae.

Description as for family.

Species 20–30, Indomalesia, Australia, New Zealand, S and W Pacific, Madagascar, Mascarenes; sthn trop. Afr. 1: *Dianella ensifolia* (L.) DC., Chimanimani Mountains in Zimbabwe and Mozambique. There is no evidence that it is a garden escape (Wild 1953).

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Hyacinthaceae
(Liliidae—Asparagales)
(Monocots—Asparagales)

Williams, R. in Leistner: 610 (2000).

Sthn trop. Afr.: genera 10, species ± 42.

Identification of the additional genus using the key in the above reference: Schizocarphus will key out under 14a: *Scilla* (which is no longer considered to be represented in Africa).

Albuca L.

Knudtzon & Stedje: 773 (1986); Stedje & Nordal: 54 (1987); Jong: 107 (1991); Stedje: 122 (1995); Stedje & Thulin: 598 (1995); Stedje: 21 (1996); Speta: 274 (1998b).

Sthn trop. Afr. 2, Angola, Zambia, Malawi, Mozambique, and sthn Afr.

Bowiea Harv. ex Hook.f.

Stedje & Nordal: 56 (1987); Van Jaarsveld: 96 (1992); Stedje: 122 (1995); Stedje & Thulin: 600 (1995); Stedje: 28 (1996); Speta: 272 (1998b); Stedje: 414 (2000).

Sthn trop. Afr. 1: *Bowiea volubilis* Hook.f. subsp. *volubilis*, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dipcadi Medik.

Obermeyer: 117 (1964); Stedje & Nordal: 58 (1987); Stedje: 122 (1995); Stedje & Thulin: 592 (1995); Stedje: 2 (1996); Speta: 275 (1998b).

Sthn trop. Afr. ± 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Drimia Jacq. ex Willd.

Stedje & Nordal: 58 (1987); Stedje: 122 (1995); Stedje & Thulin: 596 (1995); Stedje: 15 (1996); Speta: 273 (1998b); Stedje: 414 (2000).

Thuranthos C.H.Wright; Stirton: 161 (1976); Kativu & Drummond: 112 (1994); Speta: 273 (1998b). *Urginea* Steinh.; Baker: 536 (1898); Engler & Gilg: 193 (1903); Oyewole: 163 (1975a); Oyewole: 213 (1975b); Oyewole: 126 (1987); Speta: 274 (1998b).

Sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Drimiopsis Lindl. & Paxton

Stedje & Nordal: 59 (1987); Stedje: 45 (1994); Stedje: 6 (1996); Speta: 278 (1998b); Kativu: 150 (2000).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Eucomis L'Hér.

Baker: 527 (1898); Macnae & Kalk: 142 (1958); Du Plessis & Duncan: 75 (1989); Speta: 277 (1998b); Govender *et al.*: 52 (2000); Hartley & De Hertogh: 58 (2000); Mapaura (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ledebouria Roth

Stedje: 122 (1995); Stedje & Thulin: 594 (1995); Stedje: 10 (1996); Speta: 278 (1998b); Stedje: 1 (1998); Mapaura (Unpublished).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ornithogalum L.

Obermeyer: 325 (1978); Stedje & Nordal: 59 (1987); Nordal & Stedje: 12 (1993); Stedje: 122 (1995); Stedje & Thulin: 599 (1995); Stedje: 24 (1996); Speta: 276 (1998b).

Sthn trop. Afr. 2 (?3), Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Schizobasis Baker

Rendle: 48 (1899); Stedje & Thulin: 600 (1995); Stedje: 28 (1996); Speta: 272 (1998b); Stedje: 414 (2000); Phiri (Unpublished).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Schizocarphus Van der Merwe

Van der Merwe: t. 904 (1943); Speta: 119 (1998a); Speta: 277 (1998b).

Scilla in part, in sense of Stedje & Thulin: 594 (1995); Stedje: 10 (1996); Stedje: 1 (1998).

Fairly robust geophytes. **Bulb** up to 80 mm in diameter; plate plane with a dense ring of branched roots; bulb leaves imbricate, compact, apically often fibrous; tunic fibrous. **Leaves** linear to narrowly lanceolate, glabrous. **Inflorescence**: many-flowered dense racemes on 1(2) erect pubescent scape(s); pedicels 5–14 mm long, pubescent; bracts narrow. **Tepals** free, stellate, light blue to whitish or greenish white. **Filaments** whitish, patent; anthers short, bluish green. **Ovary** bluish green, very short stipitate; locules 2(–6)-ovulate. **Capsule** globose. **Seeds** ovoid, black; cotyledon epigeal.

Species ± 5, eastern tropical to sthn Afr.; sthn trop. Afr. at least 1: *Schizocarphus nervosus* (Burch.) Van der Merwe, probably more, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Hydrocharitaceae

(Alismatidae—Alismatales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 619 (2000). See also: Dahlgren *et al.*: 303 (1985); Thulin: 7 (1995); Cook: 234 (1998).

Sthn trop. Afr.: genera 7, species ± 22.

Key to genera

1a Marine plants; leaves distichous on creeping rhizomes; flowers submerged during anthesis; perianth segments 3 or ± reduced:
2a Leaves clearly differentiated into petiole and blade when mature, blade apparently pinnately veined, with midvein and prominent veins along margin ..... **Halophila**
2b Leaves sessile, with parallel veins ..... **Thalassia**
1b Freshwater plants; leaves in rosettes or cauline; flowers exserted above water or floating on surface at anthesis; perianth segments 3 + 3:
3a Leaves clearly differentiated into petiole and blade when mature ..... **Ottelia**
3b Leaves not differentiated into petiole and blade:
4a Plants forming long, leafy, submerged stems from a rhizome:
5a At least some leaves spirally arranged on the stem; leaves with 2 apical spines ..... **Lagarosiphon**
5b All leaves in whorls, rarely some opposite; leaves with 1 apical spine:
6a Leaves mostly shorter than 15 mm, often recurved; petals minute, as long as or shorter than the sepals; scales at nodes 2, fringed with orange-brown hairs ..... **Hydrilla**
6b Leaves mostly longer than 15 mm, not markedly recurved; flowers showy; petals 3 times as long as sepals; scales at nodes entire .. ***Egeria**
4b Plants rosulate, mostly with a very short stem:
7a Leaves tapering gradually towards the tip; female flowers sessile or subsessile ..... **Blyxa**
7b Leaves ± strap-shaped, narrowing abruptly near the tip; female flowers on long flexible peduncles ..... **Vallisneria**

Blyxa Noronha ex Thouars

Thouars: 4 (1806); Cook & Lüönd: 1 (1983); Simpson: 9 (1989); Cook: 244 (1998).

Submerged, freshwater, annual or perennial herbs, dioecious or bisexual; roots unbranched; stems corm-like and shortly erect, shortly rhizomatous or stoloniferous. **Leaves** radical or cauline and spirally arranged, sessile, linear to narrowly lanceolate, not differentiated into stipule, petiole and blade, flaccid, translucent, margin usually minutely toothed, midrib usually prominent. **Inflorescence**: spathe solitary in leaf axil, pedunculate or rarely sessile, 2-lobed at apex, containing 1 or 2(–22) flowers. **Flowers** unisexual or bisexual, emerging above water surface, usually one at a time from each spathe at anthesis, remaining attached to plant; male flowers long-pedicellate; female and bisexual flowers sessile or subsessile. **Sepals** (outer perianth segments) free but often forming a tube at anthesis. **Petals** filiform to lanceolate, papillose. **Stamens** 3 (in bisexual flowers) 6 or 9, in whorls of 3, all fertile, in female flowers staminodes minute; filaments filiform; anthers erect, latrorsely or introrsely dehiscent. **Ovary** of 3 carpels, 1-locular, narrowly cylindric, distally elongating into a narrowly cylindric hypanthium in bisexual and female flowers, carrying perianth to water surface; ovules many, anatropous; styles 3; stigmas 3, simple. **Fruit** an elongate, irregularly dehiscent capsule. **Seeds** ellipsoid or ovoid, smooth, tuberculate or spiny.

Species 9, tropical Old World but naturalised in N America and Europe; sthn trop. Afr. 3: Angola, Zambia, Mozambique.

***Egeria** Planch.

Obermeyer: 100 (1966); Cook: 245 (1998); Mapaura (Unpublished).

Sthn trop. Afr. 1: **Egeria densa* Planch., a potentially serious water weed, recorded from Zimbabwe and sthn Afr. but possibly also naturalised in other countries.

Halophila Thouars

Isaac: 41 (1968); Simpson: 24 (1989); Cook: 247 (1998); Bandeira: 191 (2002).

Sthn trop. Afr. 1: *Halophila ovalis* (R.Br.) Hook.f., Mozambique, and sthn Afr.

Hydrilla Rich.

Richard: 9, 61,76 (1814); Cook & Lüönd: 485 (1982); Simpson: 5 (1989); Cook: 245 (1998); Phiri (Unpublished).

Submerged, freshwater annual or perennial herbs, gynodioecious; roots unbranched; stems horizontal and stoloniferous below, erect and spreading above; bulbil-like turions (hibernacula) developing underground terminally on stolons, or axillary on erect stems or their branches. **Leaves** opposite and scale-like towards base of stem or branch, otherwise linear to ovate and in whorls of 3–8(–12), spreading or strongly recurved, flaccid, with 1 apical spine, margin denticulate, venation consisting of midrib only; stipules 0; nodal scales 2 per leaf, fringed with orange-brown hairs. **Inflorescence** axillary. **Male flowers** solitary in leaf axils, sessile, abscising as buds and opening explosively on water surface; sepals and petals (outer and inner perianth segments) reflexed; stamens 3; staminodes 0. **Female flowers** solitary, subsessile but carried to water surface by long thread-like hypanthium; perianth of 3 sepals and 3 elongate-ovate petals, spreading and floating; staminodes 3, minute; ovary of 3 carpels; ovules up to 5, anatropous; styles 3; stigmas 3, linear. **Fruit** indehiscent, cylindric, smooth or with lateral spine-like appendages. **Seeds** up to 5, narrowly ellipsoid, smooth.

Monotypic: *Hydrilla verticillata* (L.f.) Royle, Old World, naturalised in America and a serious pest in U.S.A.; sthn trop Afr.: Zambia, Mozambique, probably introduced.

Lagarosiphon Harv.

Obermeyer: 139 (1964); Symoens & Triest: 441 (1983); Simpson: 2 (1989); Cook: 246 (1998).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ottelia Pers.

Wright: 6 (1897); Cook *et al.*: 263 (1984); Simpson: 14 (1989); Cook: 243 (1998).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Thalassia Banks ex K.D.Koenig

Koenig: 96 (1805); Isaac: 44 (1968); Simpson: 22 (1989); Sartoni: 9 (1995); Cook: 247 (1998); Bandeira: 191 (2002).

Submerged, dioecious marine perennial herbs; roots unbranched; horizontal scale-bearing rhizomatous axes (long shoots) buried in substrate giving rise, at regular intervals, to erect, contracted, leaf-bearing axes (short shoots). **Leaves** distichous, 2–6, on short shoots, strap-shaped to somewhat falcate, sheathing at base, with up to 19 longitudinal veins, margins entire; stipules 0; nodal scales 0. **Inflorescences** pedunculate, 1-flowered; male spathes 1 or 2 in leaf axils, with 2 bracts connate on one side only; female spathes solitary with 2 connate bracts, cylindric. **Male flowers** shortly pedicellate, remaining attached to plant; tepals 3, strongly recurved at anthesis; stamens 3–12, anthers subsessile, 2–4-thecous, latrorsely dehiscent; pollen grains spherical, united into moniliform strings. **Female flowers** subsessile; tepals 3, similar to those of male flowers; staminodes 0; ovary of 6–8 carpels, 1(–3)-locular; ovules several, on parietal placentas; hypanthium narrowly cylindric; styles 6–8, each with 2 filiform stigmas 2–6 times as long as style. **Fruit** a globose, fleshy capsule opening by stellate dehiscence of fleshy pericarp into a number of irregular valves. **Seeds** conical with a thickened basal portion.

Species 2, coasts of Caribbean and Indo-Pacific Ocean; sthn trop. Afr. 1: *Thalassia hemprichii* (Solms) Aschers., Mozambique.

Vallisneria L.

Lowden: 269 (1982); Simpson: 12 (1989); Cook: 246 (1998).

Sthn trop. Afr. 1: *Vallisneria spiralis* L., Zambia, Zimbabwe, Malawi, and sthn Afr.

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Hypoxidaceae

(Liliidae—Asparagales)
(Monocots—Asparagales)

Snijman, D.A. in Leistner: 621 (2000).

Sthn trop. Afr.: genera 2, species ± 20.

Identification of additional genus using the key in the above reference: Curculigo will run to 5a, but it differs from *Hypoxis* in the perianth in which the lower part is fused into an elongated narrow tube (in *Hypoxis* the perianth (perigone) segments are free to the base).

Curculigo Gaertn.

Baker: 382 (1898); Nel: 258 (1914); Geerinck: 70 (1969); Hilliard & Burtt: 72 (1978); Nordal & Iversen: 50 (1986); Zimudzi: 311 (1994); Wiland: 9 (1997b); Nordal & Zimudzi: 1 (2001); Bingham & Smith: 142 (2002).

Herbaceous geophytes, acaulescent; rhizome vertical, cylindric to conical, bearing contractile roots. **Leaves** tristichous, sessile, linear-elliptic or lanceolate, plicate, becoming pseudopetiolate, sheathing at base with broad hyaline margins; indumentum of 2-armed or 3–12-armed (stellate) hairs. **Inflorescences** 1–many, borne near base of plant. **Flowers** 1–many, subsessile on rhizome or spicately arranged on a short scape. **Perianth** with lower part fused into an elongated narrow tube; lobes spreading, acute to obtuse, yellow adaxially and sparsely pilose beneath. **Stamens** 3 + 3; filaments short, arising from base of tepals; anthers 2-thecous, sagittate, latrorse. **Ovary** inferior, borne amongst leaf bases or enveloped by subtending bracts; style 1, filiform to subulate; stigmas 3 or 6. **Fruit** indehiscent, crowned by persistent perianth tube. **Seeds** ellipsoid, black and glossy, sometimes striate.

Species ± 10, widespread in trop. Africa, Asia and America; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi.

Hypoxis L.

Baker: 377 (1898); Nel: 259 (1914); Hilliard & Burtt: 72 (1978); Nordal *et al.*: 15 (1985); Nordal & Iversen: 46 (1986); Wiland: 207 (1997a); Nordal: 292 (1998); Nordal & Zamudzi: 4 (2001); Wiland-Szymańska: 302 (2001); Bingham & Smith: 142 (2002); Wiland-Szymańska & Adamski: 142 (2002).

Sthn trop. Afr. ± 18, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Iridaceae

(Liliidae—Asparagales)
(Monocots—Asparagales)

Goldblatt, P. & Manning, J.C. in Leistner: 623 (2000). General family reference: Goldblatt: 931 (1994).

Sthn trop. Afr.: genera 16, species ± 104.

Identification of additional genera using the key in the above reference: Savannosiphon is probably most closely related to **Lapeirousia** (Goldblatt 1993b), but as its corms are globose rather than bell-shaped with a flat base, it may run on to contrast 24 in the key. It can be distinguished from *Watsonia* and *Thereianthus* (which do not grow naturally in sthn trop. Afr.) by its bifacial (not unifacial or subterete) foliage leaves.

Zygotritonia is distinct by its unbranched style.

Aristea Aiton

Goldblatt: 3 (1993b); Goldblatt: 139 (1995); Goldblatt: 3 (1996a); Goldblatt & Le Thomas: 263 (1997); Goldblatt *et al.*: 318 (1998).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Babiana Ker Gawl.

Goldblatt: 55 (1993b); Goldblatt *et al.*: 328 (1998).

Sthn trop. Afr. 1: *Babiana hypogea* Burch., Zambia, Zimbabwe, and sthn Afr. .

Crocosmia Planch.

De Vos: 463 (1984); Goldblatt: 49 (1993b); Goldblatt: 42 (1996a); Goldblatt *et al.*: 332 (1998).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dierama K.Koch

Goldblatt: 132 (1981); Goldblatt: 40 (1993b); Goldblatt: 29 (1996a); Goldblatt *et al.*: 331 (1998).

Sthn trop. Afr. 8, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dietes Salisb. ex Klatt

Rudall: 471 (1983); Goldblatt: 8 (1993b); Goldblatt: 11 (1996a); Goldblatt *et al.*: 324 (1998); Donato *et al.*: 407 (2000).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ferraria Burm. ex Mill.

De Vos: 295 (1979); Boussard: 17 (1992); Goldblatt: 11 (1993b); Goldblatt *et al.*: 326 (1998).

Sthn trop. Afr. 1: *Ferraria glutinosa* (Baker) Rendle, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Freesia Klatt

Goldblatt & Manning: 161 (1995); Goldblatt: 37 (1996a); Goldblatt *et al.*: 331 (1998).

Anomatheca Ker Gawl.; Goldblatt: 52 (1993b); Bingham (Unpublished); Phiri (Unpublished).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Gladiolus L.

Goldblatt: 134 (1986a); Goldblatt: 461 (1993a); Goldblatt: 66 (1993b); Goldblatt: 48 (1996a); Goldblatt: 77 (1996b); Goldblatt & Manning: 1 (1998); Goldblatt *et al.*: 329 (1998); Bingham & Smith: 142 (2002).

Antholyza L.; Baker: 373 (1898). *Homoglossum* Salisb. ex Baker; De Vos: 326 (1976).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hesperantha Ker Gawl.

Goldblatt: 134 (1986a); Goldblatt: 59 (1993b); Goldblatt: 33 (1996a); Goldblatt & Manning: 262 (1996a); Goldblatt *et al.*: 330 (1998); Mapaura & Timberlake: 165 (2002).

Schizostylis Backh. & Harv.; Goldblatt: 62 (1993b); Goldblatt & Manning: 262 (1996a).

Sthn trop. Afr. 3, Zambia, Zimbabwe, Malawi, and sthn Afr.

Lapeirousia Pourr.

Goldblatt: 28 (1993b); Goldblatt: 22 (1996a); Goldblatt & Manning: 346 (1996b); Goldblatt *et al.*: 327 (1998).

Sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Moraea Mill.

Goldblatt: 243 (1977); Goldblatt: 351 (1982); Goldblatt: 1 (1986b); Goldblatt: 13 (1993b); Goldblatt: t. 2069 (1993c); Goldblatt: 12 (1996a); Goldblatt *et al.*: 326 (1998).

Gynandriris Parl.; Goldblatt: 24 (1993b); *Homeria* Vent.; Goldblatt: 27 (1993b).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Radinosiphon N.E.Br.

Goldblatt: 65 (1993b); Goldblatt: 47 (1996a); Goldblatt *et al.*: 329 (1998).

Sthn trop. Afr. 1, polymorphic: *Radinosiphon leptostachya* (Baker) N.E.Br., Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Romulea Maratti

Goldblatt: 63 (1993b); Goldblatt: 35 (1996a); Goldblatt *et al.*: 330 (1998); Manning & Goldblatt: 59 (2001).

Sthn trop. Afr. 1: *Romulea cameroonianа* Baker, Zambia, Zimbabwe, Malawi, and mainly sthn Afr.

Savannosiphon Goldblatt & Marais

Goldblatt & Marais: 849 (1979); Goldblatt: 27 (1993b); Goldblatt: 27 (1996a); Goldblatt *et al.*: 328 (1998).

Lapeirousia Pourr., in part.

Deciduous perennials. **Rootstock** a small globose corm with membranous to fibrous tunics. **Stem** unbranched, erect, compressed and winged above. **Leaves** few, lower 2 or 3 entirely sheathing (cataphylls); foliage leaves lanceolate, slightly plicate, lowermost ± basal, upper foliage leaves cauline and smaller. **Inflorescence** a few-flowered spike; bracts green, fairly large. **Flowers** actinomorphic, large, white, opening in evening; perianth tube long, cylindric, widening apically. **Tepals** subequal or upper tepal somewhat hooded. **Stamens** apparently symmetrically arranged; anthers with prominent acute appendages, included in perianth tube or partly exserted.

Style shortly exserted, filiform, branches deeply forked and recurved. **Capsules** ovoid, membranous. **Seeds** several per locule, globose, shiny. $x = 7$.

Monotypic: *Savannosiphon euryphyllus* (Harms) Goldblatt & Marais, SE trop. Africa; sthn trop. Afr.: Zambia, Malawi, Mozambique.

Tritonia Ker Gawl.

De Vos: 105 (1982); De Vos: 347 (1983); Goldblatt: 46 (1993b); Goldblatt: 40 (1996a); Goldblatt *et al.*: 331 (1998); Izidine & Bandeira: 57 (2002).

Sthn trop. Afr. 2, Zambia, Malawi, Mozambique, and sthn Afr.

Zygotritonia Mildbr.

Mildbraed: 230 (1923); Hepper: 144 (1968); Goldblatt: 199 (1989); Goldblatt: 57 (1993b); Goldblatt: 45 (1996a); Goldblatt *et al.*: 328 (1998).

Deciduous perennials. **Rootstock** a globose corm with membranous to fibrous tunics. **Stem** terete, often with several diverging branches. **Leaves** few, lower 2 or 3 membranous and sheathing (cataphylls); foliage leaves 2–4, lanceolate to linear, prominently nerved to somewhat plicate. **Inflorescence** a simple or branched spike with many flowers spirally arranged, much longer than basal leaves; floral bracts small, subequal, firm-textured. **Flowers** zygomorphic, relatively small, yellow, orange or white; perianth tube short, cylindric. **Tepals** unequal, upper one larger, held apart and hooded, lower 3 geniculate, channelled and forming a lip. **Stamens** unilateral and arcuate. **Style** slender, undivided. **Capsules** globose-trigonous (but often with only 2 or 1 locule developed). **Seeds** 1(2) per locule, large, ± globose to weakly angled, smooth. $x = 7$.

Species 4, trop. Africa; sthn trop. Afr. 1: *Zygotritonia nyassana* Mildbr., Zambia, N Malawi.

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Juncaceae
(Commelinidae—Juncales)
(Commelinids—Poales)

Glen, R.P. in Leistner: 639 (2000).

Sthn trop. Afr.: genus 1, species 9.

Juncus L.

Adamson: 1 (1935); Carter: 1 (1966); Haines & Lye: 31 (1983); Obermeyer: 73 (1985); Snogerup: 23 (1993); Balslev: 259 (1998); Kirschner *et al.*: 377 (1999); Mapaura (Unpublished).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Juncaginaceae
(Alismatidae—Alismatales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 639 (2000).

Sthn trop. Afr.: genus 1, species 3.

Triglochin L.

Napper: 1 (1971); Lisowski *et al.*: 2 (1982); Haynes *et al.*: 263 (1998).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

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Limnocharitaceae
(Alismatidae—Alismatales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 642 (2000). General family reference: Haynes *et al.*: 271 (1998).

Butomopsis Kunth

Symoens: 30 (1984); Phiri (Unpublished).

Tenagocharis Hochst.; Carter: 1 (1960) (under Butomaceae).

Monotypic: *Butomopsis latifolia* (D.Don) Kunth, trop. Africa; sthn trop. Afr.: Zambia, Zimbabwe, Mozambique, and sthn Afr.

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Marantaceae
(Zingiberidae—Zingiberales)
(Commelinids—Zingiberales)

Rhizomatous perennial herbs, rosulate or with erect or spreading, sometimes lianescent or bamboo-like, branched or rarely simple aerial stems. **Leaves** distichous, divided into 4 distinct zones: (1) an open sheath, (2) petiole proper, (3) a pulvinus ("calloused portion of petiole", "superior part of petiole") and (4) blade with a strong midrib and thin, closely

set, parallel, upward-curved lateral veins fusing marginally, interconnected by closely set, parallel and closely set transverse veinlets. **Inflorescence** simple or complex, usually a spicate or capitate thyrse with distichous or spiral bracts subtending flower clusters composed of 1–several 2-flowered cymules in which the 2 flowers are mirror images. **Flowers** bisexual, irregular. **Calyx**: sepals 3, free, ± similar, not petaloid. **Petals** 3, fused with androecium and style into a tube, one petal often hood-like and larger. **Androecium** in 2 whorls; outer whorl usually of 1 or 2 petaloid, showy or acicular staminodes; inner whorl of 3 members: 1 fertile stamen with 1 theca and often with a petaloid appendage, 1 hood-shaped staminode, and 1 callose, fleshy staminode often used by insects as landing stage. **Ovary** inferior, 3(1)-locular with 2 locules often empty and compressed; ovules 1 per fertile locule, arising at base, anatropous; style fused basally with floral tube; in mature, untriggered flowers style enclosed in hood of hood-shaped staminode, and bent backwards under tension, when released by a pollinator snapping forward and curling up; stigmatic surface on inner side of funnel-shaped depression in apex of style. **Fruit** a loculicidal capsule, or caryopsis-like. **Seeds** rather large; embryo horseshoe-shaped, embedded in starchy perisperm.

Genera 31, species ± 550, nearly pantropical but absent from Australia, especially numerous in America; sthn trop. Afr.: genera 10, species 21.

Loesener: 654 (1930); Milne-Redhead: 1 (1952b); Koechlin: 99 (1965); Dhetchuvi & Diafouka: 401 (1993); Mabberley: 438 (1997); Takhtajan: 539 (1997); Andersson: 278 (1998).

Key to genera

[after Hepper (1968)]

1a Stems simple, usually bearing 1–3 leaves and an apparently terminal inflorescence; or stem absent with petiole arising from rhizome; petiole without a distinct circular groove at the junction of petiole and calloused portion; ovary and fruit smooth, not muricate:
- 2a Inflorescence arising at ground level, 60–150 mm long:
  - 3a Inflorescence arising from same axis as leaves, simple or forked; fruits 3-winged, ± 30 mm in diameter; leaves very large, up to ± 0.6 x 0.4 m .. **Thaumatococcus**
  - 3b Inflorescence and leaf (leaves) arising separately on rhizome; inflorescence simple; leaves up to ± 0.35 x 0.1 m **Afrocalathea**
- 2b Inflorescence aerial; fruits ± rounded or cylindric, not winged:
  - 4a Leaves strongly asymmetric with one side nearly straight and the other rounded:
    - 5a Fruit 3-seeded, ± rounded (see also 10a below) **Marantochloa**
    - 5b Fruit 1-seeded, cylindric; inflorescence with closely imbricated bracts and erect branches **Halopegia**
  - 4b Leaves not strongly asymmetric, both sides rounded:
    - 6a Ovary 1-locular with 1 erect ovule; fruit 1-seeded, the seed filling the cavity, arillate; inflorescences lax panicles; plants of open marshes **Thalia**
    - 6b Ovary 3-locular; inflorescence borne on a simple stem terminating in a single leaf; shade plants:
      - 7a Nodes of inflorescences each with 1 cymule; each bract enclosing the part of the inflorescence above it, caducous at anthesis; each cymule with 1 fleshy bracteole; fruit with well marked sutures; seed arillate **Megaphrynium**
      - 7b Nodes of inflorescence each with 2–4 cymules; bracts not enclosing the part of the inflorescence above it, persistent; each cymule with 2 fleshy bracteoles; fruit without obvious sutures; seeds without an aril **Sarcophrynium**

1b Stems branched, sometimes repeatedly so to form a scrambling plant; leaves many; ovary and fruit 3-locular, smooth or muricate:
- 8a Junction of petiole with calloused portion marked by a distinct circular groove with thickening; ovary and fruit muricate **Hypselodelphys**
- 8b Junction of petiole with calloused portion not marked by a circular groove, only marked by a change in texture; calloused portion uninterrupted with midrib on lower surface; fruits not muricate:
  - 9a Bracts suborbicular; stems often prickly; leaves hardly asymmetric, both sides curved **Haumania**
  - 9b Bracts oblong; stems not prickly; leaves strongly asymmetric with one side curved and the other almost straight; cymules without fleshy bracteoles; seeds arillate:
    - 10a Bracts acute; flowers borne at different levels; fruit ultimately dehiscent; inflorescence erect **Marantochloa**
    - 10b Bracts obtuse; flowers ± side by side; fruits indehiscent; inflorescence ± reflexed **Ataenidia**

Afrocalathea K.Schum.

Schumann: 51 (1902); D'Orey: 54 (1981); Dhetchuvi & Diafouka: 406 (1993); Andersson: 290 (1998).

Acaulescent rhizomatous herbs with leaves and inflorescences on separate shoots. **Leaves** 1 or 2; lamina elliptic to lanceolate, glabrous; petiole up to twice as long as lamina, ± terete. **Inflorescence** a simple thyrse on a short peduncle arising directly on rhizome, 2-flowered cymules supported by 2-keeled bracts; bracteoles absent. **Flowers** sessile on a very short common axis. **Corolla**: tube ± equalling lobes (± 10 times longer than wide). **Androecium**: outer staminodes 2, slightly unequal, petaloid; hooded staminode with a short, flat appendage near base of lobe. **Ovary** with 3 ovulate locules. **Fruit** and **seed** unknown.

Monotypic genus: *Afrocalathea rhizantha* (K.Schum.) K.Schum. (= *Calathea rhizantha* K.Schum.), W trop. Africa; sthn trop. Afr.: Angola.

Ataenidia Gagnep.

Gagnepain: xli (1908); Milne-Redhead: 168 (1952a); Milne-Redhead: 8 (1952b); D'Orey: 54 (1981); Dhetchuvi & Diafouka: 445 (1993); Andersson: 287 (1998).

Phrynium sensu Schumann: 52 (1902), in part.

Tufted rhizomatous herbs; stems erect or spreading, branched, bearing 1 inflorescence and several leaves. **Leaves**: petiole long, part directly below blade calloused; blade elliptic, asymmetric, acuminate, ± rounded at base. **Inflorescence** terminal, much branched, congested; spathes persistent; branches with few nodes, with up to 4, 2-flowered subsessile cymules at each node, each cymule backed by a 2-nerved prophyll; bracteoles absent. **Flowers** in each cyme ± side by side but opening at different times. **Corolla**: tube ± as long as lobes. **Androecium**: outer staminodes 2, petaloid; hooded staminode without appendage near apex. **Ovary** with 3 ovulate locules, pubescent. **Fruit** with papyraceous pericarp, indehiscent, 1–3-seeded. **Seeds** arillate.

Monotypic genus: *Ataenidia conferta* (Benth.) Milne-Redh., trop. Africa; sthn trop. Afr.: Angola.

Halopegia K.Schum.

Schumann: 49 (1902); Hepper: 85 (1968); D'Orey: 54 (1981); Dhetchuvi & Diafouka: 406 (1993); Andersson: 292 (1998).

Rosulate marsh plants with short rhizome and simple stems. **Leaves**: petiole very long, sheathing in lower half, terete towards apex; lamina elongate-oblong. **Inflorescence** a simple or sparsely branched synflorescence; florescence consisting of a single cymule; axes conspicuously flattened and furrowed; bracts persistent, imbricate; bracteoles absent. **Sepals** markedly unequal. **Corolla**: tube very short to absent. **Androecium**: outer staminode(s) 1, or 2 very unequal; callose staminode conspicuous, with narrow petaloid margin; hooded staminode with a simple often ± obsolete appendage near top of lobe. **Ovary** 3-locular, ovulate or 2 of them poorly developed, empty and flattened. **Fruit** caryopsis-like, 1-locular and 1-seeded.

Species 6, tropical Old World: Africa, India, Java; sthn trop. Afr. 1: *Halopegia azurea* (K.Schum.) K.Schum., Angola.

Haumania J.Léonard

Léonard: 453 (1949); Evrard & Bamps: 367 (1959); Milne-Redhead: 161 (1950); Hepper: 89 (1968); D'Orey: 51 (1981) as *Haumannia*; Dhetchuvi & Diafouka: 409 (1993); Andersson: 292 (1998).

Climbing plants with slender, flexible stems. **Leaves** ovate-oblong, lower surface ± pubescent; petiole present or not. **Inflorescence** of composite cymes arranged in spikes; spathes persistent, ± orbicular, white; cymules without bracteoles. **Flowers** large. **Sepals** 3, petaloid. **Petals** 3; tube ± half as long as lobes. **Androecium**: staminodes petaloid, outer staminodes 2. **Ovary** with 3 ovulate locules. **Fruit** indehiscent, globose-depressed; exocarp tuberculate. **Seeds** exarillate.

Species 2, trop. Africa; sthn trop. Africa 1: *Haumania liebrechtsiana* (De Wild. & T.Durand) J.Léonard, Angola.

Hypselodelphys (K.Schum.) Milne-Redh.

Milne-Redhead: 158 (1950); Koechlin: 107 (1965); D'Orey: 50 (1981); Andersson: 289 (1998).

Hybophrynium braunianum K.Schum.: 428 (1892). *Trachyphrynium braunianum* (K.Schum.) Baker; Milne-Redhead: 2 (1952b); D'Orey: 49 (1981); Dhetchuvi & Diafouka: 413 (1993); Andersson: 289 (1998).

Subscandent, much branched perennials with bamboo-like shoots simple below and clothed with sheathing coriaceous cataphylls, branched and leafy above. **Leaves**: petiole jointed shortly above top of sheath; blades asymmetric. **Inflorescence** terminal, simple or sometimes branched at base, spike-like with a jointed rachis and a 2-flowered cymule at each distichous node, each flower subtended by a small fleshy bracteole. **Corolla**: tube ± one-quarter as long as lobes. **Androecium**: outer staminodes 2, petaloid; hooded staminode with a 2-branched appendage. **Ovary** 3-locular, densely muricate. **Fruit** a dehiscent, muricate, 1–3-seeded capsule. **Seed** smooth, with a basal aril.

Species 5, trop. Africa; sthn trop. Afr. 4, Angola. Andersson (1998) notes that the only important difference between this genus and *Trachyphrynium braunianum* (K.Schum.) Baker, the only species of this genus, is in fruit structure, and that this distinction is not very convincing.

Marantochloa Brongn. ex Gris.

Gris: 321 (1860); Milne-Redhead: 5 (1952b); Koechlin: 118 (1965); D'Orey: 51 (1981); Dhetchuvi & Diafuka: 433 (1993); Dhetchuvi: 369 (1996); Andersson: 290 (1998).

Phrynium sensu Schumann: 52 (1902) in part.

Glabrous or pubescent, rhizomatous perennials with ± woody, erect or spreading, usually branched stems. **Leaves** strongly asymmetric. **Inflorescence** lax or congested, each branch with ± 4 nodes, with 1 or 2, 2-flowered cymules, without fleshy bracteoles at each node. **Androecium**: outer staminodes 2, petaloid; hooded staminode with a short flat appendage near middle of lobe. **Ovary** 3-locular, often pilose. **Capsule** tardily dehiscent, smooth, ± pubescent. **Seed** with a small basal aril.

Species ± 15, trop. Africa, Réunion and Comoro Islands; sthn trop. Afr.: 7, Angola.

Megaphrynium Milne-Redh.

Milne-Redhead: 169 (1952a); Milne-Redhead: 4 (1952b); Dhetchivu & Diafouka: 427 (1993); Andersson: 289 (1998).

Phrynium sensu Schumann: 52 (1902) in part.

Rhizomatous, erect perennial herbs; stems simple, bearing an inflorescence and a single subtending leaf. **Leaves** arising either singly from stem or directly from rhizome; petiole sometimes up to 5 m long; blade elliptic, ± symmetric. **Inflorescence** terminal, more or less branched; branches jointed with many internodes, and a 2-flowered pedunculate cymule at each node, subtended by a caducous sheathing bract enclosing the cymule; bracteole 1(2), glandular, fleshy; spathes caducous. **Corolla**: tube ± half as long as lobes. **Androecium**: outer staminodes 2(1), often markedly uneven, subulate and erect; hooded staminode with 2-branched appendage, branches ± equal, divergent. **Ovary** with 3 ovulate locules. **Fruit** ± globose, somewhat fleshy but with 3 conspicuous sutures and dehiscent. **Seeds** with a laciniate arillus surrounded by copious mucilage.

Species 5, trop. Africa; sthn trop. Afr. 2, Angola.

Sarcophrynium K.Schum.

Schumann: 35 (1902); Gossweiler & Mendonça: 63 (1939); Milne-Redhead:

168 (1952a); Milne-Redhead: 4 (1952b); Hepper: 87 (1968); Dhatchuvi & Diafouka: 420 (1993); Andersson: 290 (1998).

Erect, glabrous or pubescent, rosulate rhizomatous herbs; stem simple, bearing inflorescence and a single subtending leaf surrounded by several leaves arising directly from rhizome or at base of stem. **Leaves** elliptic or oblong-elliptic, slightly asymmetric. **Inflorescence** terminal, branched; branches with few to many nodes, with up to 4, 2-flowered pedunculate cymules at each node subtended by a sheathing bract, each cymule backed by a 2-nerved prophyll. **Flowers** borne at different levels, each subtended by a fleshy, glandular bracteole. **Corolla**: tube ± half as long as lobes. **Androecium**: outer staminodes 2(1), petaloid, hooded staminode with 2-branched appendage, branches ± equal, divergent. **Ovary** with 3 ovulate locules, glabrous. **Fruit** fleshy, indehiscent, without obvious sutures. **Seeds** surrounded by a mucilaginous mantle-like aril.

Species ± 3, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda).

Thalia L.

Linnaeus: 1193 (1753); Schumann: 202 (1903); Loesener: 692 (1930); Koechlin: 142 (1965); Hepper: 85 (1968); Andersson: 48 (1981a); Andersson: 241 (1981b); D'Orey: 55 (1981); Dhetchuvi & Diafouka: 431 (1993); Andersson: 292 (1998).

Erect, perennial marsh plants with a basal rosette of leaves and an often very elaborate synflorescence. **Leaves** ovate-lanceolate, rounded or subcordate at base. **Inflorescence** paniculate, with slender branches; bracts subtending flower pairs boat-shaped, deciduous; bracteoles absent. **Calyx** of 3 very small, similar, hyaline sepals. **Petals** free but adnate to staminal tube for a very short distance, membranous. **Androecium**: outer staminode 1, petaloid, showy; hood-shaped staminode with 2 appendages near middle of lobe, both pointing down into staminal tube; callose staminode firm and fleshy with a petaloid margin; fertile stamen with a petaloid appendage. **Ovary** 1-locular, with a single ovule; style helically twisted when triggered, with a very long, lip-like protrusion from ventral rim of stigmatic orifice. **Fruit** caryopsis-like, with very thin pericarp. **Seed** with a small 2-lobed aril; perisperm canal branched from base.

Species 5–7, tropical America, with 1 species, *Thalia geniculata* L. (=*T. welwitschii* Ridl.) extending to trop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe. Mabberley (1997) describes pollen transfer as follows: pollen deposited on style in bud, and insect proboscis touching style promotes explosive S-shaped movement; in 0.03 seconds style becomes erect, scrapes pollen from proboscis into stigmatic hollow and deposits home pollen on proboscis.

Thaumatococcus Benth.

Bentham: 652 (1883); Schumann: 40 (1902); Hepper: 81 (1968); D'Orey: 55 (1981); Dhetchuvi & Diafouka: 403 (1993); Andersson: 292 (1998).

Rhizomatous, rosulate perennial herbs with simple stems. **Leaves** asymmetric, ± broadly ovate-elliptic, shortly acuminate, rounded-truncate at base, with very many parallel nerves diverging from midrib at an angle of ± 45°; petiole very long, subterete. **Inflorescence** simple or very sparsely branched; spathes caducous; cymules single, very shortly pedicelled; bracteole solitary, glandular. **Sepals** 3, free, broadly linear. **Corolla**: tube very short. **Androecium**: outer staminodes absent. **Ovary** with 3 ovulate locules, silky. **Fruit** large, fleshy, indehiscent, with 3 thick wings; endocarp mucilaginous. **Seeds** with aril of membranous sheets sticking to testa.

Monotypic genus: *Thaumatococcus daniellii* (Benn.) Benth. (=*Phrynium daniellii* Benn.), trop. Africa; sthn trop. Afr.: Angola (Cabinda).

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Mayacaceae
(Commelinidae—Commelinales)
(Commelinids—Poales)

Freshwater aquatic herbs, submerged, floating or growing in swamps, with slender, densely leafy stems bearing adventitious roots. **Leaves** spirally arranged, sessile, linear to filiform, without basal sheath, bidentate at apex. **Flowers** bisexual, regular, solitary, aerial but without nectarines; pedicels long, in axils of sheathing bracts but may appear to be terminal. **Sepals** 3, free, green, valvate to subvalvate. **Petals** 3, free, shortly clawed, imbricate, white. **Stamens** 3, alternipetalous; filaments filiform, glabrous; anthers basifixed, tetrasporangiate to bisporangiate, opening by apical pores or pore-like slits, covered in young state by a dome-shaped operculum. **Ovary** superior, 1-locular, composed of 3 carpels, with 3 parietal placentas; ovules several to many, in 2 rows on each placenta, bitegmic, orthotropous; style terminal, filiform; stigma entire to slightly divided. **Fruit** a loculicidal capsule opening by 3 valves. **Seeds** ovoid to globose, striate, operculate; embryo small; endosperm copious, containing starch and aleurone.

Genus 1, species 3–9 in tropical America, 1 in tropical W Africa. Formerly widely considered to be closely related to Commelinaceae, but now thought to be closer to Xyridaceae (Stevenson 1998).

Faden: 387 (1985); Takhtajan: 542 (1997); Stevenson: 294 (1998).

Mayaca Aubl.

Aublet: 42 (1775); Brown: 525 (1902); Boutique: 1 (1971a); Boutique: 90 (1971b); Stevenson: 295 (1998).

Description as for family.

Species 4–10, tropical America and tropical W Africa; sthn trop. Afr. 1: *Mayaca baumii* Gürke, Angola, Zambia.

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Musaceae
(Zingiberidae—Zingiberales)
(Commelinids—Zingiberales)

Archer, C. in Leistner: 643 (2000). General family references: Lock: 1 (1993); Anderson: 296 (1998).

Sthn trop. Afr.: genus 1, species 3.

Ensete Horan.

Baker & Simmonds: 405 (1953/1954); Lock: 2 (1993); White *et al.*: 103 (2001); Coates Palgrave: 117 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

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Najadaceae
(Alismatidae—Najadales)
(Monocots—Alismatales; included in Hydrocharitaceae)

Glen, R.P. in Leistner: 644 (2000).

Sthn trop. Afr.: genus 1, species 4.

Najas L.

Symoens: 64 (1984); Triest: 1 (1987); Triest: 1 (1989); Brummitt: 722 (1992) under Hydrocharitaceae; Haynes *et al.*: 305 (1998).

Sthn trop Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Orchidaceae

(Liliidae—Orchidales)
(Monocots—Asparagales)

Kurzweil, H. in Leistner: 644 (2000).

This account is largely based on La Croix & Cribb (1995/1998).

The classification of the family into subfamilies and tribes follows Dressler (1993).

Genera ± 800, species ± 20 000, cosmopolitan but most numerous in the moist tropics and subtropics; sthn trop. Afr.: genera 67, species ± 632.

Key to the subfamilies of Orchidaceae

1a Anthers 2 or 3:
2a Anther filaments fused to the column near the base only; staminode absent; lip petaloid or nearly so, never saccate ..... **Apostasioideae** (not found in Africa)
2b Anther filaments fused to the column stalk; staminode present, usually terminal and shield-shaped; lip deeply saccate ..... **Cypripedioideae** (not found in Africa)
1b Anther solitary, although the anther loculi can be well separated:
3a Anther attached to the column by the base, the loculi adnate to the column, persistent; pollinia granular or sectile with caudicles and two (rarely one) viscidia; mostly terrestrial with erect leafy stem, terminal inflorescence, and root-stem tuberoids ..... **Orchidoideae**
3b Anther attached to the column by the apex, usually at the back of the column and either operculate or erect and persistent, caudicle and viscidia then being at the top:
4a Pollinia granular, occasionally mealy, or much divided into small masses attached to a common axis; anther opening lengthwise; plants usually terrestrial ..... **Spiranthoideae**
4b Pollinia waxy, entire, 2, 4 or 8, free or adhering at one end by caudicles or attached to 1 or 2 viscidia; anther operculate; plants terrestrial, epiphytic, lithophytic, or scrambling lianas ..... **Epidendroideae & Vandeae**

Key to the genera of Spiranthoideae

1a Plants with woody stems and rhizomes; inflorescences 1–several, branching, glabrous; flowers more than 30 mm long ..... **Corymborkis**
1b Plants up to c. 0.5 m; stems and rhizomes fleshy; inflorescence solitary, unbranched, often pubescent or glandular; flowers less than 10 mm long:
2a Lip tapering to a blunt apex; sepals and petals 7–9 mm long ..... **Platylepis**
2b Lip with a transversely oblong apical lobe; sepals and petals 6 mm long or less:
3a Lateral sepals united for about half their length ..... **Cheirostylis**
3b Lateral sepals free to the base ..... **Zeuxine**

Key to the genera of Orchidoideae

1a Spur formed by the dorsal sepal, not formed by the lip or lateral sepals:
2a Lip with lobed or deeply divided margins, appearing bearded; flowers blue, purplish blue or rarely white; leaves grass-like, tufted (=*Herschelianthe*) ..... **Disa**
2b Lip entire; flowers not blue; leaves lanceolate, elliptic or ovate:
3a Lateral sepals appressed to the ovary; pollinia attached to a single viscidium ..... (=*Monadenia*) **Disa**
3b Lateral sepals spreading; each pollinium attached to its own viscidium:
4a Petals free from the dorsal sepal; anther erect or horizontal ..... **Disa**
4b Petals united to the dorsal sepal; anther horizontal ..... **Brownleea**
1b Spur or spurs or sacs, if present, formed by the lip or lateral sepals:
5a Lip with 1 or 2 distinct, sometimes small, spurs:
6a Spurs 2; flowers resupinate with the lip uppermost ..... **Satyrium**
6b Spur single; flowers not resupinate:
7a Lip more or less united to the column:
8a Leaves 1 or 2, radical, orbicular or ovate ..... **Holothrix**
8b Leaves usually several, borne on the stem, not orbicular:
9a Stigmas sessile ..... **Schizochilus**
9b Stigmas borne on variously lengthened stalks:
10a Stigmatic arms divided into 2 elongated branches, the lower fertile and capitate, the upper sterile and horn-like .. **Centrostigma**
10b Stigmatic arms unbranched ..... **Habenaria** (in part)
7b Lip free from the column:

11a Stigmas sessile:
12a Flowers usually purple, mauve, white or rarely yellow; sepals and petals more than 3 mm long ..... **Brachycorythis** (in part)
12b Flowers tiny, yellow with a green lip; sepals and petals up to 2 mm long ..... **Oligophyton**
11b Stigmas borne on, or forming, club-shaped processes, projecting from the front of the column, free or partly united with the lateral lobes of the rostellum:
13a Lateral sepals and front lobe of the petals joined to the lip and to the stigmatic arms in their lower parts; tooth in mouth of spur ..... **Bonatea**
13b Lateral sepals and front lobe of petals not united at the same time; tooth absent in mouth of spur:
14a Stigmas 2-lobed, the lobes projecting in different directions, upwards and downwards ..... **Roeperocharis**
14b Stigmas simple, not branched:
15a Stigmatic processes partly united to the side lobes of the rostellum:
16a Flowers pink or mauve; side lobes of lip entire ..... **Cynorkis**
16b Flowers green; side lobes of lip fimbriate ..... **Habenaria** (in part)
15b Stigmatic processes free from the rostellum:
17a Flowers yellow or orange; mid-lobe of rostellum concave, placed in front of the anther ..... **Platycoryne**
17b Flowers green or white; mid-lobe of rostellum usually flat or subulate ..... **Habenaria** (in part)

5b Lip not spurred, sometimes boat-shaped at the base:
18a Lip adnate to the front of the column, bearing incurled lateral appendages:
19a Lateral sepals not spurred; petals much wider than long ..... **Corycium**
19b Lateral sepals spurred or saccate; petals longer than wide ..... **Disperis**
18b Lip not adnate to the front of the column, lateral appendages absent:
20a Plant dwarf, leafless ..... **Schwartzkopffia**
20b Plant small to large, leafy:
21a Margins of lip divided in the apical part ..... **Stenoglottis**
21b Margins of lip entire:
22a Lip with a basal callus, not boat-shaped at the base ..... **Neobolusia**
22b Lip without a basal callus, boat-shaped at the base ..... **Brachycorythis** (in part)

Key to the genera of Epidendroideae

1a Plants terrestrial saprophytes, lacking leaves and chlorophyll:
2a Lip lacking a spur; pedicels elongating rapidly after fertilization ..... **Didymoplexis**
2b Lip with a spur; pedicels not elongating after fertilization:
3a Lip entire, lacking longitudinal crests on lip; pollinia soft, sectile ..... **Epipogium**
3b Lip 3-lobed, bearing longitudinal crests in basal half; pollinia hard, attached to a noticeable viscidium ..... **Eulophia** (in part)
1b Plants terrestrial, epiphytic or lithophytic, usually with green leaves, rarely epiphytic and lacking green leaves but then with green roots:
4a Plants terrestrial, scrambling or climbing:
5a Plants scrambling or climbing, liana-like ..... **Vanilla**
5b Plants terrestrial:
6a Inflorescence appearing well before the solitary leaf emerges ..... **Nervilia**
6b Inflorescence appearing with the leaves, or sometimes after the leaves have fallen:
7a Pollinia 8, clavate; flowers turning blue if bruised:
8a Column short, adnate to the lip base; spur as long as or longer than the lip ..... **Calanthe**
8b Column elongate, not adnate to the lip except at the base; spur much shorter than the lip ..... **Phaius**
7b Pollinia 2 or 4; flowers not turning blue when bruised:
9a Inflorescence terminal:
10a Flowers pubescent; lip bipartite, the hypochile saccate and articulated to a fleshy epichile ..... **Epipactis**
10b Flowers glabrous; lip entire or lobed:
11a Inflorescence branching; lip spurred ..... (=*Acrolophia*) **Eulophia**
11b Inflorescence simple; lip lacking a spur:
12a Column very short, with basal auricles of lip on either side of the column ..... **Malaxis**
12b Column elongate, lacking basal auricles around the lip:
13a Rostellum short, not flabellate; tubers or pseudobulbs present ..... **Liparis**
13b Rostellum elongate and flabellate; tubers or pseudobulbs absent ..... **Orestias**
9b Inflorescence lateral or basal:
14a Plants with above-ground pseudobulbs:
15a Pseudobulbs of one node ..... **Oeceoclades**
15b Pseudobulbs of several nodes, or stems caulescent ..... **Eulophia** (in part)
14b Plants with underground tubers or swollen rhizomes:
16a Lip lacking a spur; column short, lacking a foot ..... **Pteroglossaspis**
16b Lip with a spur or saccate base; column with a short to long foot ..... **Eulophia** (in part)

4b Plants epiphytic:
17a Plants with monopodial growth, always lacking pseudobulbs; leaves when present distichous, fleshy, conduplicate, usually unequally

2-lobed at the apex; inflorescences always axillary; pollinia with stipes and viscidium ..... **Tribe Vandeae** (see key below)
17b Plants with sympodial growth, with or without pseudobulbs; leaves plicate to conduplicate or iris-like; pollinia with or without stipes and viscidium:
18a Leaves iridiform, bilaterally compressed, distichous; flowers minute, less than 2 mm across, in whorls in a tapering densely-flowered inflorescence ..... **Oberonia**
18b Leaves flat, needle-like or terete:
19a Flowers with a ± distinct conical to cylindric mentum formed by the lateral sepals and column-foot:
20a Pollinia 8 ..... **Stolzia**
20b Pollinia 2 or 4:
21a Inflorescence terminal ..... **Polystachya**
21b Inflorescences lateral, basal:
22a Leaves 1 or 2 on pseudobulb ..... **Bulbophyllum**
22b Leaves several, pine-needle-like ..... **Chaseella**
19b Flowers lacking a mentum; column-foot absent:
23a Lip lacking a spur; flowers large, yellow, distinctively spotted with maroon on sepals and petals; pseudobulbs elongate-fusiform .... **Ansellia**
23b Lip spurred at the base; flowers small, yellow, flushed but not spotted with maroon-brown on sepals and petals ..... **Graphorkis**

Key to the genera of Vandeae

1a Leaves reduced to achlorophyllous scales, or absent:
2a Stems elongate; roots scattered along the stem ..... **Solenangis** (in part)
2b Stems very short; roots clustered:
3a Flowers orange; sepals and petals united into a tube in lower part; lip with a hooded apex; pollinia 4 ..... **Taeniophyllum**
3b Flowers usually white; sepals and petals free; lip apex not hooded; pollinia 2 ..... **Microcoelia**
1b Leaves present, with chlorophyll:
4a Sepals and petals pale yellow, blotched or marked with reddish-brown; lip fleshy; pollinia 4 in 2 pairs ..... **Acampe**
4b Sepals and petals unicoloured; pollinia 2:
5a Flowers borne in a capitate head; rostellum distinctively reflexed in apical half to lie parallel to the basal part ..... **Ancistrorhynchus**
5b Flowers solitary or in a lax to dense raceme; rostellum not as above:
6a Leaves iris-like:
7a Spur shorter than 5 mm, cylindric to conical; inflorescence axis as long as or longer than the leaves ..... **Bolusiella**
7b Spur longer than 8 mm, conical, broad at base, constricted in middle and inflated into 2 sacs or lobules at apex; inflorescence axis shorter than leaves ..... **Podangis**
6b Leaves flat, semi-terete or terete:
8a Rostellum retuse, not projecting beyond the column apex; stipites obscure or apparently absent:
9a Column-foot saccate, spurred, the lip articulated below the spur at the apex of the column-foot ..... **Aeranthes**
9b Column lacking a foot; lip spurred:
10a Lip ovate to cordate with the base enfolding the column ..... **Angraecum**
10b Lip lanceolate or subpandurate, the base not enfolding the column ..... **Jumellea**
8b Rostellum projecting beyond the column apex, often pendent; stipes 1 or 2, elongate, attached to 1 or 2 viscidia:
11a Flowers borne in whorls at the nodes of the inflorescence:
12a Lip obscurely 3-lobed, 10 mm or longer, fringed ..... **Diaphananthe** (in part)
12b Lip entire; 4 mm long or less, margins entire ..... **Chamaeangis**
11b Flowers borne singly at the inflorescence nodes:
13a Spur abruptly geniculate in middle and dilated at the apex:
14a Lip 3-lobed; rachis markedly zigzag; stem elongate ..... **Calyptrochilum**
14b Lip entire; rachis ± straight; stem very short ..... **Eurychone**
13b Spur saccate to cylindric, not as above:
15a Pollinia attached by a single stipes to a viscidium:
16a Lip cordate ..... **Cardiochilos**
16b Lip not cordate:
17a Lip uppermost in flower; viscidium shoe-shaped ..... **Summerhayesia**
17b Lip lowermost in flower:
18a Stipes Y-shaped ..... **Ypsilopus**
18b Stipes linear or oblanceolate:
19a Lip 2- or 3-lobed in apical half, sometimes obscurely so:
20a Lip 3-lobed in apical part, lobes triangular, tapering or fimbriate ..... **Tridactyle**
20b Lip broadly 2-lobed in apical half ..... **Nephrangis**
19b Lip entire, not lobed in apical half:
21a Flowers stellate, white, sometimes variously tinged with green or pink on spur; stem usually short; leaves oblanceolate or obovate, flat ..... **Aerangis**

21b Flowers white, pale green, yellow or brown; lip with basal auricles; stem usually elongate; leaves linear or oblong, flat or terete:
22a Leaf with a distinct ligule borne at top of sheath opposite the lamina ..... **Eggelingia**
22b Leaf lacking a ligule:
23a Leaves awl-shaped, up to 13 x 1 mm; flowers not opening widely, white; lip lacking basal auricles ..... **Solenangis**
23b Leaves linear to oblong, longer than 25 mm; flowers opening widely, not white; lip with basal auricles ..... **Tridactyle** (in part)

15b Pollinia attached by two stipites to one or two viscidia:
24a Pollinia attached by separate stipes to a separate viscidium:
25a Lip strongly 3-lobed in the middle; rostellum of 3 equal lobes ..... **Angraecopsis** (in part)
25b Lip entire or obscurely lobed:
26a Lip with a small tooth in the mouth of the spur; middle lobe of rostellum fleshy and shortly clavate, the side lobes obscure ..... **Diaphananthe** (in part)
26b Lip lacking a tooth in the mouth of the spur; rostellum thick-textured, 3-lobed:
27a Rostellar lobes papillate, the outer lobes exceeding the middle lobe ..... **Mystacidium**
27b Rostellar lobes glabrous, ± equal ..... **Angraecopsis** (in part)
24b Pollinia with stipites attached to a single viscidium:
28a Flowers pale translucent yellow or green:
29a Lip with a small tooth or fleshy swelling in the mouth of the spur ..... **Diaphananthe** (in part)
29b Lip lacking any tooth or swelling in mouth of spur:
30a Inflorescences erect, laxly many-flowered; leaves usually longer than 80 mm ..... **Cribbia**
30b Inflorescences pendent, of many closely-spaced secund pale green flowers; leaves very small, shorter than 50 mm ..... **Angraecopsis** (in part)
28b Flowers white, rarely marked with green on lip:
31a Lip lanceolate, similar to sepals and petals; rostellar side arms longer than the column; viscidium linear, saddle-shaped, hyaline or bipartite ..... **Cyrtorchis**
31b Lip obscurely 3-lobed, differently shaped from sepals and petals; rostellar side arms shorter than the column; viscidium suboblong, never bipartite ..... **Rangaeris**

Acampe Lindl.

(Epidendroideae—Vandeae)

La Croix & Cribb: 363 (1995/1998).

Sthn trop. Afr. 1: *Acampe pachyglossa* Rchb.f., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aerangis Rchb.f.

(Epidendroideae—Vandeae)

Schelpe: 388 (1976); La Croix & Cribb: 381 (1995/1998); Mapaura & Timberlake: 166 (2002); Msekandiana & Mlangeni: 37 (2002).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Aeranthes Lindl.

(Epidendroideae—Vandeae)

Lindley: t. 817 (1824); La Croix & Cribb: 365 (1995/1998); Mapaura & Timberlake: 166 (2002).

Epiphytic, monopodial herbs with short stems. **Inflorescence** (floral axis) axillary, branched or unbranched, usually slender and pendent, rarely erect. **Flowers** translucent, green or white; lateral sepals adnate at base to column; lip entire, spur arising from column foot. **Column** long or short; side lobes of rostellum always longer than mid-lobe; pollinia 2, each with its own stipe and viscidium; stipes usually long, often geniculate. **Ovary** often articulated to pedicel.

Species ± 30, Madagascar, Comoro Islands and Mascarene Islands, 2 known from mainland Africa, both in Zimbabwe.

Ancistrorhynchus Finet

(Epidendroideae—Vandeae)

Finet: 44 (1907); Schlechter: 137 (1918); Summerhayes: 203 (1944); La Croix & Cribb: 393 (1995/1998).

Epiphytic monopodial herbs. **Stems** short, covered with old sheathing leaf bases; roots clustered at base of stem. **Leaves** imbricate, ligulate or tapering, unequally 2-lobed at apex, lobes sometimes dentate. **Inflorescences** axillary, from leaf bases or lower leaves, ± sessile, usually in globose or ellipsoid heads; bracts papery, usually as long as flowers. **Flowers** white, sometimes with green on lip. **Sepals** and petals free, subsimilar; lip oblong or orbicular, entire or 3-lobed, ecallose, spurred at base; spur straight, sigmoid or geniculate, sometimes swollen at apex and/or mouth. **Column** short; rostellum projecting down and then abruptly upcurved in apical half, 2-lobed, each lobe falcate and acute; anther cap hemispherical, with a short, truncate appendage in front; pollinia 2, globose; stipes either 2 and subspathulate, or 1 and bifid; viscidium 1.

Species ± 16, trop. Africa, sthn trop. Afr. 1: *Ancistrorhynchus tenuicaulis* Summerh., Malawi.

Angraecopsis Kraenzl.

(Epidendroideae—Vandeae)

Kraenzlin: 171 (1900); Schlechter: 600 (1914); Perrier: 80 (1941); Summerhayes: 242 (1951); Schelpe: 393 (1976); La Croix & Cribb: 395 (1995/1998); Mapaura & Timberlake: 166 (2002).

Small, epiphytic, monopodial herbs. **Leaves** distichous, ligulate to oblanceolate, often falcate, unequally 2-lobed at apex. **Inflorescences** axillary, racemose, few- to many-flowered. **Flow-**

ers small, white, green or yellow, with a relatively long pedicel. **Bracts** small, sheathing at base. **Lateral sepals** often oblanceolate and asymmetric at base, usually longer than dorsal sepal. **Petals** usually smaller, triangular, often adnate to lateral sepals at base. **Lip** entire or 3-lobed, ecallose, spurred. **Column** short; rostellum 3-lobed or bifid; pollinia 2, stipes 2; viscidia 2, rarely 1.

Species ± 15, trop. Africa and Mascarene Islands; sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Angraecum Bory

(Epidendroideae—Vandeae)

Schelpe: 388 (1976); La Croix & Cribb: 368 (1995/1998); Mapaura & Timberlake: 166 (2002).

Sthn trop. Afr. ± 17, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ansellia Lindl.

(Epidendroideae—Cymbidieae)

Schelpe: 386 (1976); La Croix & Cribb: 549 (1995/1998).

Sthn trop. Afr. 1: *Ansellia africana* Lindl., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bolusiella Schltr.

(Epidendroideae—Vandeae)

Schelpe: 388 (1976); La Croix & Cribb: 401 (1995/1998).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Bonatea Willd.

(Orchidoideae—Orchideae)

La Croix & Cribb: 43 (1995/1998); Johnson & Liltved: 5 (1997).

Sthn trop. Afr. 6, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Brachycorythis Lindl.

(Orchidoideae—Orchideae)

Schelpe: 383 (1976); Geerinck: 341 (1982); La Croix & Cribb: 14 (1995/1998); Bingham & Smith: 142 (2002).

Sthn trop. Afr. 16, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Brownleea Harv. ex Lindl.

(Orchidoideae—Diseae)

Linder: 188 (1995); Linder & Kurzweil: 345 (1996).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bulbophyllum Thouars

(Epidendroideae—Dendrobieae)

Schelpe: 386 (1976); La Croix & Cribb: 293 (1995/1998); Fibeck & Phiri: 38 (1997); Fibeck & Mavi: 147 (2000); Mapaura & Timberlake: 167 (2002).

Sthn trop. Afr. 23, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Calanthe R.Br.

(Epidendroideae—Arethuseae)

Schelpe: 386 (1976); La Croix & Cribb: 273 (1995/1998).

Sthn trop. Afr. 1: *Calanthe sylvatica* (Thouars) Lindl., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Calyptrochilum Kraenzl.

(Epidendroideae—Vandeae)

Kraenzlin: 30 (1895); Schelpe: 387 (1976); La Croix & Cribb: 403 (1995/1998).

Monopodial, epiphytic herbs with long woody stems. **Leaves** alternate, fleshy, twisted at base to lie in one plane. **Inflorescences** short; flowers resupinate, white. **Sepals** and **petals** free, similar, spreading, petals slightly shorter than sepals. **Lip** 3-lobed, spurred, spur inflated at apex. **Column** short and stout with a small foot. **Rostellum** prominent; anther apiculate; pollinia 2, globose, joined to a long linear caudicle; viscidium 1, large, triangular, grooved at base to clasp the rostellum.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi.

Cardiochilos P.J.Cribb

(Epidendroideae—Vandeae)

Cribb: 183 (1977); La Croix & Cribb: 405 (1995/1998).

Small, monopodial, epiphytic herbs. **Stems** short, rooting at base. **Leaves** several, distichous, linear. **Inflorescences** arising at base of plant and in axils of lower leaves. **Flowers** non-resupinate, green to straw-coloured, scabrid on outside. **Sepals** and petals subsimilar; lip obscurely 3-lobed, concave, ecallose, spurred at base. **Column** short; rostellum narrow, bifid, truncate. **Pollinia** 2, globose; stipe 1, linear; viscidium 1, reniform.

Monotypic genus: *Cardiochilos williamsonii* P.J.Cribb, known only from Malawi and southern Tanzania.

Centrostigma Schltr.

(Orchidoideae—Orchideae)

Schelpe: 385 (1976); La Croix & Cribb: 48 (1995/1998); Mapaura & Timberlake: 167 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Chamaeangis Schltr.

(Epidendroideae—Vandeae)

Schlechter: 107 (1918); La Croix & Cribb: 407 (1995/1998).

Monopodial, epiphytic herbs, erect or pendent. **Stem** long or short, covered with old sheathing leaf bases. **Leaves** distichous, linear to oblanceolate, unequally 2-lobed at apex, fleshy or coriaceous. **Inflorescence** densely many-flowered, often with 2–4 flowers in a whorl at each node. **Flowers** small, cream, green, yellowish or orange-coloured. **Sepals** and **petals** free, subsimilar, spreading; lip more or less entire, ecallose, spurred at base; spur cylindrical, sometimes much swollen at the apex. **Column** short, fleshy, without a foot; rostellum short, bifid; pollinia 2, globose; stipes 2; viscidium 1, ovate or round.

Species ± 7, trop. Africa; sthn trop. Afr. 2, Malawi.

Chaseella Summerh.

(Epidendroideae—Dendrobieae)

Summerhayes: 88 (1961); La Croix & Cribb: 291 (1995/1998); Mapaura &

Timberlake: 167 (2002).

Dwarf epiphytic herbs. **Pseudobulbs** small, spaced out along a slender creeping rhizome. **Leaves** 6–12, narrowly cylindric, fleshy, acute. **Inflorescence** 1(2)-flowered; peduncle very short. **Flowers** small, resupinate, somewhat campanulate; pedicel and ovary with some short black hairs. **Sepals**: dorsal one ovate; lateral ones obliquely ovate, acute, recurved at apex, forming a rounded mentum. **Petals** obliquely elliptic; lip mobile, somewhat recurved, broadly ovate, rounded at apex, slightly cordate at base, ± channelled. **Pollinia** 2, triangular.

Monotypic: *Chaseella pseudohydra* Summerh., trop. Africa; sthn trop. Afr.: Zimbabwe.

Cheirostylis Blume
(Spiranthoideae—Cranichideae)
La Croix & Cribb: 8 (1995/1998).

Sthn trop. Afr. 1: *Cheirostylis gymnochiloides* (Ridl.) Rchb.f., Zimbabwe, and sthn Afr.

Corycium Sw.
(Orchidoideae—Diseae)
La Croix & Cribb: 226 (1995/1998).

Sthn trop. Afr. 1: *Corycium dracomontanum* Parkman & Schelpe, Malawi, and sthn Afr.

Corymborkis Thouars
(Spiranthoideae—Tropidieae)
Schelpe: 386 (1976); La Croix & Cribb: 6 (1995/1998).

Sthn trop. Afr. 1: *Corymborkis corymbis* Thouars, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cribbia Senghas
(Epidendroideae—Vandeae)
Senghas: 19 (1985); La Croix & Cribb: 409 (1995/1998).

Small epiphytic or lithophytic monopodial herbs with slender roots. **Leaves** distichous, twisted at base to lie in one plane, articulated at base to persistent, imbricate leaf sheaths. **Inflorescences** racemose, laxly few- to many-flowered. **Flowers** small to medium-sized, translucent, white, greenish or straw-orange in colour. **Sepals** and **petals** free, lip entire, ecallose, spurred at base. **Column** terete; rostellum short, 3-lobed, midlobe slightly longer than side lobes, pendent; pollinia 2, subglobose; stipes 2, linear; viscidia 2, very small.

Species 4, trop. Africa; sthn trop. Afr. 1: *Cribbia brachyceras* (Summerh.) Senghas, Zambia.

Cynorkis Thouars
(Orchidoideae—Orchideae)
Schelpe: 384 (1976); La Croix & Cribb: 50 (1995/1998).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cyrtorchis Schltr.
(Epidendroideae—Vandeae)
Schelpe: 388 (1976); Nseya & Arends: 75 (1995); La Croix & Cribb: 411 (1995/1998).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Diaphananthe Schltr.
(Epidendroideae—Vandeae)
Schelpe: 388 (1976); La Croix & Cribb: 417 (1995/1998); Mapaura & Timberlake: 167 (2002).

Listrostachys Reichb. in part.

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Didymoplexis Griff.
(Epidendroideae—Gastrodieae)
La Croix & Cribb: 268 (1995/1998).

Sthn trop. Afr. 1: *Didymoplexis africana* Summerh., Zimbabwe, Malawi, Mozambique, and sthn Afr.

Disa P.J.Bergius
(Orchidoideae—Diseae)
Schelpe: 385 (1976); Linder: 159 (1995); Johnson *et al.*: 402 (1998); Kurzweil: 644 (2000); Bellstedt *et al.*: 2088 (2001); Bingham & Smith: 142 (2002).

Herschelianthe Rauschert; Linder: 194 (1995). *Monadenia* Lindl.; Linder: 339 (1981); Linder: 197 (1995).

Sthn trop. Afr. 37, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Disperis Sw.
(Orchidoideae—Diseae)
Schelpe: 385 (1976); Manning & Linder: 38 (1992); La Croix & Cribb: 228 (1995/1998); Bingham & Smith: 142 (2002).

Sthn trop. Afr. 22, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Eggelingia Summerh.
(Epidendroideae—Vandeae)
Summerhayes: 235 (1951); La Croix & Cribb: 425 (1995/1998).

Epiphytic, monopodial herbs with long, slender, leafy stems. **Leaves** distichous, linear or ligulate, articulated at base to persistent leaf sheaths, these sheaths bearing a hair-like ligule at apex opposite leaf. **Inflorescences** axillary, short, few-flowered. **Flowers** small, white. **Sepals** and **petals** free, subsimilar. **Lip** entire, ovate, ecallose, spurred. **Column** short, fleshy. **Pollinia** 2, ovoid; stipe 1, ligulate or Y-shaped; viscidium 1, large, rectangular, almost as long as stipe. **Rostellum** deflexed, triangular, bifid.

Species 3, trop. Africa; sthn trop. Afr. 1: *Eggelingia clavata* Summerh., Malawi.

Epipactis Zinn
(Epidendroideae—Neottieae)
Zinn: 85 (1757); La Croix & Cribb: 14 (1995/1998).

Terrestrial herb, occasionally saprophytic, with very short rhizomes, numerous fleshy roots and simple erect leafy stems. **Leaves** ovate or lanceolate, plicate. **Inflorescence** racemose; flowers usually dull reddish or greenish, pedicelled. **Sepals** and **petals** free. **Lip** with no spur, but with hypochile forming a nectar-containing cup; hypochile articulated to epichile by a narrow joint. **Column** short, flat or concave in front, with a shallow cup at apex; anther free, 2-celled, hinged at back of column apex, behind stigma and rostellum; pollinia 2, attached near rostellum apex, each longitudinally divided, caudicles absent; pollen grains in friable masses loosely bound by fine threads. **Stigma** broad, with large, globular rostellum plaeed centrally above it.

Species ± 25, mostly north temperate regions; sthn trop. Afr. 1: *Epipactis africana* Rendle, Malawi.

Epipogium Borkh.

(Epidendroideae—Gastrodieae)

Borkhausen: 139 (1792); Schelpe: 385 (1976); La Croix & Cribb: 271 (1995/1998).

Leafless, saprophytic herb lacking chlorophyll; rhizome tuberous. **Scape** erect with a few basal sheaths; inflorescence terminal. **Tepals** free, subequal; lip spurred, concave with verrucose crests. **Column** and anther short; pollinia 2, sectile, each with a slender, curved caudicle and a single broad viscidium. **Stigma** broad, prominent; rostellum absent. **Capsule** ovoid, pendulous, developing quickly.

Species 2, 1 in temperate Eurasia, 1 in Old World tropics: *Epipogium roseum* (D.Don) Lindl., Angola, Malawi.

Eulophia R.Br. ex Lindl.

(Epidendroideae—Cymbidieae)

Schelpe: 386 (1976); Kidson & Fletcher: 24 (1994); La Croix & Cribb: 458 (1995/1998); Mapaura & Timberlake: 167 (2002).

Acrolophia Pfitzer in part; Williamson: 147 (1977).

Sthn trop. Afr. ± 90, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Eurychone Schltr.

(Epidendroideae—Vandeae)

Schlechter: 134 (1918); Schelpe: 388 (1976); Wood: 585 (1989); La Croix: 153 (2001).

Epiphytic, monopodial, short-stemmed herbs. **Leaves** broadly oblong-elliptic, obovate or ligulate, unequally bilobed at apex. **Inflorescence** pendent, 2–12-flowered, often shorter than leaves. **Flowers** large, thin-textured, ± translucent, scented. **Sepals** and **petals** subsimilar, erect or spreading. **Lip** funnel-shaped, tapering into a wide-mouthed spur sharply constricted in middle, then recurved and swollen at apex. **Column** short and broad, lacking a foot; rostellum elongated, ligulate; anther cucullate, retuse; pollinia 2, ellipsoid; stipe 1, linear; viscidium 1, oblong or ovate, relatively large. (After La Croix: 156; 2001).

Species 2, trop. Africa; sthn trop. Afr. 1: *Eurychone galeandrae* (Rchb.f.) Schltr., Angola.

Graphorkis Thouars

(Epidendroideae—Cymbidieae)

Thouars: 318 (1809); La Croix & Cribb: 547 (1995/1998).

Epiphytic, sympodial herbs. **Pseudobulbs** clustered, conical-ovoid to cylindrical-fusiform, with several nodes, partly covered by fibrous leaf bases; roots of two types, some attached to substrate and some aerial, erect. **Leaves** developing after flowering, petiolate, narrowly elliptic, acute or acuminate, thin-textured, plicate. **Inflorescence** paniculate, many-flowered; flowers resupinate, yellowish, marked with brown or purple. **Sepals** and **petals** free; lip 3-lobed, spurred at base; disc with 2 keels. **Column** with hirsute basal auricles; rostellum elongate; pollinia 2, waxy, sessile, attached to a solitary viscidium.

Species 5, 4 in Madagascar, 1 in trop. Africa: *Graphorkis lurida* (Sw.) Kuntze, Zambia.

Habenaria Willd.

(Orchidoideae—Orchideae)

Schelpe: 384 (1976); La Croix & Cribb: 59 (1995/1998); Bingham & Smith: 143 (2002); Mapaura & Timberlake: 167 (2002); Msekandiana & Mlangeni: 37 (2002).

Kryptostoma Summerh.; Phiri (Unpublished).

Sthn trop. Afr. ± 120, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Holothrix Rich. ex Lindl.

(Orchidoideae—Orchideae)

Schelpe: 383 (1976); La Croix & Cribb: 34 (1995/1998); Bingham & Smith: 143 (2002).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Jumellea Schltr.

(Epidendroideae—Vandeae)

La Croix & Cribb: 379 (1995/1998).

Sthn trop. Afr. 2, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Liparis Rich.

(Epidendroideae—Malaxideae)

Schelpe: 386 (1976); La Croix & Cribb: 275 (1995/1998).

Sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Malaxis Sol. ex Sw.

(Epidendroideae—Malaxideae)

Swartz: 8, 119 (1788); La Croix & Cribb: 282 (1995/1998).

Microstylis Nutt.

Dwarf terrestrial, lithophytic or epiphytic herbs with creeping rhizomes or fusiform tuberous roots. **Stems** leafy, ± swollen at base; leaves thin-textured, plicate. **Inflorescence** erect, terminal, racemose or subumbellate, few- to many-flowered. **Flowers** small, resupinate, green, yellow-green, buff, orange or purple. **Sepals** and **petals** free, similar or dissimilar,

lip larger than tepals, entire or lobed, often ± auriculate at base; often with dentate margins. **Column** short; stigma ventral; anther terminal; pollinia ovoid, 4 in 2 pairs joined at base.

Species ± 300, cosmopolitan but mainly tropical Asia, 7 known from Africa; sthn trop. Afr. 5, Zambia, Zimbabwe, Malawi, Mozambique.

Microcoelia Lindl.

(Epidendroideae—Vandeae)

Schelpe: 388 (1976); Fibeck & Phiri: 79 (1998); La Croix & Cribb: 427 (1995/1998).

Encheiridion Summerh.; Williamson: 184 (1977).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Mystacidium Lindl.

(Epidendroideae— Vandeae)

La Croix & Cribb: 435 (1995/1998).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Neobolusia Schltr.

(Orchidoideae—Orchideae)

La Croix & Cribb: 26 (1995/1998); Mapaura & Timberlake: 167 (2002).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Nephrangis (Schltr.) Summerh.

(Epidendroideae—Vandeae)

Summerhayes: 301 (1948); La Croix & Cribb: 438 (1995/1998).

Epiphytic monopodial herbs. **Stem** long, leafy, simple or branching. **Leaves** distichous, needle-shaped. **Inflorescences** arising along stem opposite leaves, 1–6-flowered, shorter than leaves. **Flowers** small, translucent, brownish or green-brown. **Sepals** and **petals** spreading or reflexed; lip spurred. **Column** short; rostellum elongate, porrect, shortly recurved at apex; anther ovate, cucullate, broadly rostrate, obtuse; pollinia 2, ellipsoid, each with a short spathulate-liguliform stipe; viscidium 1, triangular, rounded, truncate.

Monotypic: *Nephrangis filiformis* (Kraenzl.) Summerh., widely distributed in trop. Africa; sthn trop. Afr.: Zambia.

Nervilia Comm. ex Gaudich.

(Epidendroideae—Nervilieae)

Schelpe: 385 (1976); Pettersson: 250 (1995).

Sthn trop. Afr. ± 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Oberonia Lindl.

(Epidendroideae—Malaxideae)

La Croix & Cribb: 286 (1995/1998).

Sthn trop. Afr. 1: *Oberonia disticha* (Lam.) Schltr., Zimbabwe, Malawi, and sthn Afr.

Oeceoclades Lindl.

(Epidendroideae—Cymbidieae)

Phillipson & Condy: 48 (1997); La Croix & Cribb: 538 (1995/1998); Hermans: 2 (2001); Mapaura & Timberlake: 167 (2002).

Eulophidium Pfitz.; Schelpe: 386 (1976); Williamson: 147 (1977).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Oligophyton H.P.Linder

(Orchidoideae—Orchideae)

Linder in Linder & Williamson: 314 (1986); Linder: 57 (1995); Mapaura & Timberlake: 167 (2002).

Terrestrial herb perennating by testicular tubers. **Leaves** dimorphic, with ovate spreading basal leaves and loosely convoluted cauline leaves. **Inflorescence** an erect lax spike; bracts half as long as ovaries, green to somewhat chartaceous. **Flowers** small, more or less resupinate, with sepals and petals not spreading; ovary twisted. **Sepals** free, entire, 1-nerved. **Petals** more or less enclosed by sepals, 3-nerved, slightly shorter than sepals. **Lip** shorter than sepals and petals and enclosed by them, 3-lobed and 3-nerved; side lobes blunt and shorter than mid-lobe; spur short, straight or curved. **Column** short; rostellum square with a very small mid-lobe; viscidia separate and held in shallow notches in rostellum side lobes; staminodes minute; anther erect, 2-celled; stigma 2-lobed, lobes sessile, slightly convex, diverging from base.

Monotypic: *Oligophyton drummondii* H.P.Linder & G.Will., endemic to E Zimbabwe.

Orestias Ridl.

(Epidendroideae—Malaxideae)

Ridley: 197 (1887) as *Orestia*; Rolfe: 18, 578 (1897/1898); Williamson: 115 (1977); Geerinck: 281 (1984); Phiri (Unpublished).

Small, inconspicuous, erect, terrestrial herbs with usually simple stem often rooting at lower nodes; rhizome simple; tubers absent. **Leaves** up to 6, scattered along stem, shortly petiolate, elliptic to ovate, almost completely glabrous. **Inflorescence** a simple terminal raceme of 8–many minute, inconspicuous flowers; bracts often longer than perianths. **Flowers** resupinate, maroon to greenish. **Sepals** free, ovate, up to 2 mm long, partly reflexed. **Petals** free, linear, ± as long as sepals, partly reflexed. **Lip** free, simple, rounded, papillose. **Column** long and thin; rostellum flat, rounded with slight lateral lobes, similar to that of *Malaxis*; pollinia partly covered with blunt anther cap.

Species 3, trop. Africa; sthn trop. Afr. 1: *Orestias foliosa* Summerh., Zambia, Zimbabwe, Malawi.

Phaius Lour.

(Epidendroideae—Arethuseae)

Loureiro: 517, 529 (1790); Schelpe: 386 (1976); La Croix & Cribb: 275 (1995/1998).

Terrestrial (rarely epiphytic) herb with fibrous roots, sometimes with pseudobulbs. **Leaves** arising from a pseudobulb or spaced along stem, petiolate, plicate. **Inflorescence** 1- to few-flowered. **Sepals** and **petals** free, subequal; lip erect, entire or

3-lobed, spurred or saccate, with longitudinal ridges on upper surface. **Column** long, clavate; anther operculate, incumbent, 2-celled. **Pollinia** 8, in 2 groups of 4 with caudicles but no viscidia. **Stigma** near apex of column.

Species ± 50, tropical regions of the Old World, 2 in mainland Africa; sthn trop. Afr. 1: *Phaius occidentalis* Schltr., Angola, Zambia, Zimbabwe, Malawi.

Platycoryne Rchb.f.

(Orchidoideae—Orchideae)

Reichenbach: 212 (1855); Summerhayes: 58 (1958); Schelpe: 385 (1976); La Croix & Cribb: 148 (1995/1998); Fibeck: 146 (2000); Bingham & Smith: 143 (2002); Mapaura & Timberlake: 167 (2002).

Terrestrial herbs with fleshy or tuberous roots and leafy, unbranched stems. **Flowers** resupinate, usually yellow, orange or greenish, rarely white, often in short, dense heads. **Sepals** free, dorsal sepal forming a hood with petals. **Lip** entire or 3-lobed, spurred. **Column** erect; anther erect with parallel locules, canals adnate to side lobes of rostellum. **Rostellum** large, usually placed in front of anther which is often overtopped by mid-lobe; lateral lobes porrect, usually projecting beyond hood but sometimes short and shoulder-like. **Stigmatic** processes thickened with rounded ends.

Species 20–25, trop. Africa and Madagascar; sthn trop. Afr. 13, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Platylepis A.Rich.

(Spiranthoideae—Cranichidae)

Schelpe: 386 (1976); La Croix & Cribb: 6 (1995/1998).

Sthn trop. Afr. 1: *Platylepis glandulosa* (Lindl.) Rchb.f., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Podangis Schltr.

(Epidendroideae—Vandeae)

Schlechter: 82 (1918); Schelpe: 388 (1976); Wood: 489 (1989).

Epiphytic, entirely glabrous herbs; stem usually abbreviated, erect. **Leaves** iris-like, equitant, fleshy, with imbricate bases. **Inflorescence** an axillary, open, subumbellate raceme shorter than leaves; bracts small, scarious. **Flowers** resupinate, narrow, medium-sized. **Ovary** narrowly long-pedicellate. **Sepals** and **petals** free, spreading; petals slightly shorter. **Lip** orbicular, with a long narrowly conical spur inflated and often bilobed at apex. **Gynostemium** short, with a foot; rostellum narrow, bifid; anther terminal; pollinia 2, globose, each with a narrow stipe; viscidium solitary, relatively large.

Monotypic: *Podangis dactyloceras* (Rchb.f.) Schltr., trop. Africa; sthn trop. Afr.: Angola.

Polystachya Hook.

(Epidendroideae—Epidendreae)

Schelpe: 386 (1976); Geerinck: 99 (1980); La Croix & Cribb: 325 (1995/1998); Mapaura & Timberlake: 167 (2002); Msekandiana & Mlangeni: 37 (2002).

Sthn trop. Afr. ± 50, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pteroglossaspis Rchb.f.

(Epidendroideae—Cymbidieae)

Reichenbach: 67 (1878); Pettersson: 79 (1983–84); La Croix & Cribb: 544 (1995/1998).

Terrestrial, sympodial herbs. **Stem** subterranean, made up of a chain of fleshy, lobed tubers. **Leaves** 1–3, petiolate, linear-lanceolate, plicate, enclosed in sheaths towards base. **Scape** arising with leaves from current year's growth, covered with subscarious tubular sheaths. **Inflorescence** a short terminal raceme, usually with conspicuous bracts exceeding flowers. **Flowers** medium sized, resupinate or nonresupinate. **Sepals** and **petals** free, spreading, petals usually slightly shorter than sepals but otherwise similar. **Lip** lacking a claw, usually 3-lobed but sometimes entire, not spurred or saccate, flat, with either disc entirely tuberculate or nerves tuberculate, verrucose or keeled; mid-vein of side lobes often raised into a ridge at base. **Column** short, broad, curved, with 2 auricles at base, lacking a foot or with a very rudimentary foot; anther terminal, ovate, obtuse, apiculate, unilocular; pollinia 2, subglobose; stipe 1, short and broad; viscidium 1, scale-like.

Species 7, 5 in tropical and subtrop. Africa, 2 in the New World; sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique.

Rangaeris (Schltr.) Summerh.

(Epidendroideae—Vandeae)

Schelpe: 388 (1976); La Croix & Cribb: 438 (1995/1998).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Roeperocharis Rchb.f.

(Orchidoideae—Orchideae)

Reichenbach: 104 (1881); La Croix & Cribb: 157 (1995/1998).

Terrestrial herbs with tuberous roots, leafy stem and terminal inflorescence. **Flowers** green; sepals and petals free. **Lip** free, 3-lobed (rarely entire), with cylindrical spur. **Column** erect; anther thecae divergent, separated by a broad connective; canals hardly developed; pollinaria 2, each with a sectile pollinium, long caudicle and small viscidium. **Stigmatic** processes each 2-lobed with one lobe projecting down in front of lip-base, the other lobe upright in front of anther connective. **Rostellum** 3-lobed, mid-lobe low, rounded or emarginate, adnate to connective; side lobes spreading, narrowed towards apex.

Species 5, eastern Africa; sthn trop. Afr. 2, Zambia, Malawi.

Satyrium Sw.

(Orchidoideae—Diseae)

Schelpe: 385 (1976); La Croix & Cribb: 199 (1995/1998); Bingham & Smith: 143 (2002); Mapaura & Timberlake: 167 (2002).

Sthn trop. Afr. 39, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schizochilus Sond.

(Orchidoideae—Orchideae)

La Croix & Cribb: 30 (1995/1998); Mapaura & Timberlake: 167 (2002).

Sthn trop. Afr. 4, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schwartzkopffia Kraenzl.

(Orchidoideae—Orchideae)

Kraenzlin: 177 (1900); Schelpe: 383 (1976); La Croix & Cribb: 26 (1995/1998).

Terrestrial herbs only a few centimeters tall, leafless and lacking in chlorophyll. **Roots** thick, fleshy. **Stem** short, covered with imbricate sheaths. **Flowers** 1–5, relatively large, pedicellate. **Sepals** free; **petals** joined to column in lower part. **Lip** with a cup-like hypochile, and an epichile 3-lobed near apex. **Column** erect; anther locules parallel, canals scarcely developed; pollinia caudicles short, viscidia naked; stigma cushion-like; rostellum mid-lobe small, erect, cucullate, side lobes auriculate, surrounding column.

Species 2, trop. Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Solenangis Schltr.

(Epidendroideae—Vandeae)

Schelpe: 388 (1976); Fibeck & Phiri: 82 (1998); La Croix & Cribb: 442 (1998).

Sthn trop. Afr. 3, Angola, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stenoglottis Lindl.

(Orchidoideae—Orchideae)

La Croix & Cribb: 41 (1995/1998).

Sthn trop. Afr. 2, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stolzia Schltr.

(Epidendroideae—Podochileae)

Schlechter: 564 (1915); Williamson: 128 (1977); Cribb: 79 (1978); La Croix & Cribb: 288 (1995/1998); Mapaura & Timberlake: 168 (2002); Msekandiana & Mlangeni: 37 (2002).

Dwarf, mat-forming epiphytic herbs, rarely lithophytic; stems creeping, bearing pseudobulbs. **Pseudobulbs** asymmetrical ovoid, fusiform or clavate, 1- or 2-leaved at apex. **Leaves** fleshy or leathery, spreading or erect. **Inflorescence** terminal on pseudobulb, erect, 1- to many-flowered. **Flowers** ± secund, somewhat campanulate, green, yellow, orange, brown or red, sometimes striped. **Lateral sepals** joined at base, forming a mentum with column foot. **Lip** entire, recurved, V-shaped in cross-section, not spurred. **Column** foot at least three times as long as column; pollinia 8, comprising 4 large and 4 small pollinia; stigma concave, with a flap-shaped rostellum in front.

Species ± 15, trop. Africa; sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique.

Summerhayesia P.J.Cribb

(Epidendroideae—Vandeae)

Cribb: 184 (1977); La Croix & Cribb: 444 (1995/1998).

Epiphytic monopodial herbs; stems short, leafy; roots arising at stem base. **Leaves** distichous, conduplicate, linear or ligulate. **Inflorescences** arising in leaf axils, many-flowered. **Flowers** rather fleshy, white or creamy-yellow. **Sepals** and **petals** subsimilar. **Lip** entire, concave, clasping column, spurred at base. **Column** short, stout; androclinium transverse; anther convex; pollinia 2; stipe 1, short; viscidium slipper-shaped; rostellum 3-lobed, mid-lobe acute, lateral lobes obscure.

Species 3, trop. Africa; sthn trop. Afr. 1: *Summerhayesia zambesiaca* P.J.Cribb, Zambia, Zimbabwe, Malawi.

Taeniophyllum Blume

(Epidendroideae—Vandeae)

Blume: t. 3, fig. 176 (1825); La Croix & Cribb: 365 (1995/1998); Msekandiana & Mlangeni: 37 (2002).

Very small leafless epiphytic herbs with short, simple stems; roots abundant, photosynthetic. **Inflorescence** axillary, racemose. **Flowers** resupinate, ± erect, tubular. **Tepals** joined ± halfway; sepals and petals similar, but sepals slightly darker; lip free, spurred. **Column** very short; anther erect with 4 pollinia in 2 unequal pairs; stipe and viscidium 1; rostellum minutely 3-lobed.

Species ± 170, Asia, Australasia, 1 in trop. Africa: *Taeniophyllum coxii* (Summerh.) Summerh., Zimbabwe, Malawi.

Tridactyle Schltr.

(Epidendroideae—Vandeae)

Schelpe: 388 (1976); Hennessy: 90 (1994); La Croix & Cribb: 446 (1998); Mapaura & Timberlake: 168 (2002).

Listrostachys Reichb. in part.

Sthn trop. Afr. 12, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Vanilla Mill.

(Epidendroideae—Vanilleae)

Schelpe: 385 (1976); La Croix & Cribb: 247 (1995/1998); White *et al.*: 105 (2001); Mapaura & Timberlake: 168 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Ypsilopus Summerh.

(Epidendroideae—Vandeae)

La Croix & Cribb: 456 (1995/1998).

Sthn trop. Afr. 1: *Ypsilopus erectus* (P.J.Cribb) P.J.Cribb & J.L.Stewart, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Zeuxine Lindl.

(Spiranthoideae—Cranichideae)

Schelpe: 386 (1976); La Croix & Cribb: 10 (1995/1998).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

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Pandanaceae
(Arecidae—Pandanales)
(Monocots—Pandanales)

Trees or shrubs, dioecious, usually sympodially branched, with leaves crowded towards ends of branches, and often with proproots at base; stems with annulate leaf scars. **Leaves** in 3 ranks appearing as spirals (therefore the common name *screw pines*), simple, glabrous, base sheathing, blade linear-ensiform, entire but armed on margins, and on adaxial face of midrib with prickles. **Inflorescences** terminal, sometimes lateral or axillary, usually unisexual, many-flowered, spicate or capitate spadices subtended by foliaceous bracts. **Flowers** unisexual, very small, sessile, without or with a rudimentary perianth. **Male flowers**: stamens many; filaments free or connate; anthers 2-thecous, longitudinally dehiscent. **Female flowers** consisting of 1 or several free or fused carpels; 1-locular; containing 1 or several anatropous, bitegmic ovules; stigma sessile. **Infructescence** composed of many monodrupes (from 1-carpellate flowers) or polydrupes (from several-carpellate flowers) crowded into a large subglobose to ellipsoid structure. **Seeds** straight, with membranous seed coat; embryo small, straight; endosperm copious, oily. x = usually 30.

Genera 3, species 800–900, palaeotropical; sthn trop. Afr.: genus 1, species 8.

Warburg: 1 (1900); Lebrun & Stork: 104 (1995); Stone *et al.*: 397 (1998).

Pandanus Parkinson

Parkinson: 46 (1773); Rendle: 84 (1899); Gossweiler & Mendonça: 115 (1939); White: 431 (1962); Hepper: 170 (1968); Stone: 260 (1974); Huynh: 3 (1986); Huynh: 17 (1988); Huynh: 21 (1989); Beentje: 1 (1993); Huynh: 91 (1997); Stone *et al.*: 402 (1998); Coates Palgrave: 96 (2002); Bingham (Unpublished); Phiri (Unpublished).

Description as for family.

Species ± 600, palaeotropics and subtropics, ± 50 in Africa; sthn trop. Afr. 8, Angola, Zambia, ?Zimbabwe (at least very close to Mozambique border), Mozambique.

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Poaceae
(Gramineae)
(Commelinidae—Cyperales/Poales)
(Commelinids—Poales)

Fish, L. in Leistner: 659 (2000).

The classification of genera is according to Clayton & Renvoize (1986). The main reference for this account is *Flora zambesiaca* 10(1–4).

Sthn trop. Afr.: genera 189 (10 exotic), species 870.

Key to tribes

The characters used in this and the following keys are not all applicable to Poaceae outside the area covered by this work. Although morphologically incorrect, in accordance with common usage in agrostological literature the term *pedicelled* is applied to a stalked spikelet. This key and the subsequent keys are based on the following works: Launert (1971), Clayton & Renvoize (1986), Clayton (1989), Cope (1999), Fish (2000) and Clayton (2002).

1a Arborescent or shrubby plants, flowering erratically. Culms woody, usually very tall (up to 25 m, 50–125 mm in diameter), hollow but often thick-walled. Leaf lamina finally disarticulating from the sheath, usually constricted at the base into a pseudo-petiole ..... **1. Bambusoideae**—1. BAMBUSEAE (p.424)

1b Perennial or annual herbs, rarely shrubby, flowering annually. Culms herbaceous, if woody then never more than 25 mm in diameter. Leaf lamina not disarticulating from the sheath, usually sessile, if with pseudopetiole then the other characters not applicable:

2a Spikelets unisexual, different in size and shape; the sexes in different inflorescences, in different parts of the same inflorescence or mixed. Spikelets 1- or 2-flowered:

3a Spikelets 2-flowered:

4a Rachis of the inflorescence leaf-like, with the margins folding over short racemes inserted along its midrib ..... **1. Bambusoideae**—5. PHYLLORHACHIDEAE (p. 425)

4b Rachis of the inflorescence triquetrous or cylindric, but not leaf-like ..... **6. Panicoideae**—4. ANDROPOGONEAE (MAYDEAE) (p. 430)

3b Spikelets 1-flowered:

5a Female spikelets sessile or shortly pedicelled; glumes shorter than the floret, acute or apiculate; lemmas chartaceous, inflated, utriculate-urceolate, closed but for a small circular pore through which the stigmas emerge, covered with hooked hairs. Leaf lamina with the lateral nerves slanting ..... **1. Bambusoideae**—2. PHAREAE (p. 425)

5b Female spikelets on long, clavate pedicels; glumes much longer than the floret, long-caudate; lemma coriaceous, whitish, glossy, glabrous, open. Leaf lamina with the lateral nerves running parallel to the midrib ..... **1. Bambusoideae**—3. OLYREAE (p. 425)

2b Spikelets with all the florets bisexual or with some male or sterile and the rest bisexual (the male or sterile floret(s) either below or above the bisexual one(s)). Spikelets 1–many-flowered:

6a Spikelets 1–many-flowered, disintegrating at maturity above the usually persistent glumes, if falling entire then not 2-flowered with the superior floret bisexual and the inferior male or sterile. Spikelets usually laterally compressed to a varying degree:

7a Lemmas either 9-awned or with 4–6 apical hyaline lobes alternating with 5 awns ..... **5. Chloridoideae**—1. PAPPOPHOREAE (p. 426)

7b Lemmas 1–3-awned, entire or 2-lobed:

8a Leaf lamina with distinct transverse veinlets (usually best observed on the lower surface):

9a Ovary glabrous. Spikelets usually more than 4-flowered, if 1–3-flowered then leaves with pseudopetiole. Lemmas 5–7-nerved ..... **3. Centothecoideae**—CENTOTHECEAE (p. 425)

9b Ovary with the apex distinctly pilose. Spikelets 1–4-flowered. Lemma 3–± 5-nerved (rarely fully 5-nerved) ..... **2. Pooideae**—1. POEAE in part (p. 425)

8b Leaf lamina without transverse veinlets:

10a Rachilla internodes densely penicillate near the apex; the hairs 4–10 mm long, obscuring the lemma. Robust reedy perennials with bamboo-like culms up to 8 m tall. Panicles large, plumose ..... **4. Arundinoideae**—1. ARUNDINEAE (p. 426)

10b Rachilla internodes glabrous or pilose, if pilose then hairs not longer than 3 mm. Plants much smaller, not reed-like:

11a Spikelets falling off entire at maturity, 1-flowered, arranged solitarily or in groups along the rigid persistent axis of a raceme or spike-like panicle; glumes either covered with 3 conspicuously thickened straight or hooked hairs or drawn out into a long slender awn which is several times as long as the body of the glume ..... **5. Chloridoideae**—4. CYNODONTEAE (ZOYSIEAE) (p. 427)

11b Spikelets breaking up at maturity leaving the glumes behind, 1–many-flowered, if falling entire then arranged in panicles:

12a Spikelets arranged in spikes or racemes, these either solitary, digitate or scattered along a common axis:

13a Spikelets sunk into cavities on alternate sides of the rachis of a solitary spike:

14a Rachis of the spike fragile, disarticulating between the spikelets ..... **5. Chloridoideae**—3. LEPTUREAE (p. 427)

14b Rachis of the spike persistent or disarticulating irregularly ..... **5. Chloridoideae**—4. CYNODONTEAE (CHLORIDEAE) in part *(Oropetium)* (p. 427)

13b Spikelets not sunk into cavities of the rachis:

15a Spikelets arranged on opposite sides of the rachis and facing it laterally. Ovary with the apex pilose:

16a Spikelets sessile or 1-flowered ..... **2. Pooideae**—5. TRITICEAE (p. 425)

16b Spikelets shortly pedicelled, many-flowered ..... **2. Pooideae**—5. TRITICEAE (BRACHYPODIEAE) (p. 425)

15b Spikelets in secund spikes or racemes, if (rarely) on opposite sides then arranged edgeways towards the rachis:

17a Spikelets with 1 bisexual floret only, with or without male or sterile florets beneath or above it ..... **5. Chloridoideae**—4. CYNODONTEAE (CHLORIDEAE) (p. 427)

17b Spikelets with 2–many bisexual florets:

18a Spikes or racemes solitary or scattered along a common axis ..... **5. Chloridoideae**—2. ERAGROSTIDEAE (p. 426)

18b Spikes or racemes digitate:

19a Ligule a membrane, glabrous. Spikelets with 2 or 3 (rarely 4) florets usually followed by 2 to several sterile ones ..... **5. Chloridoideae**—4. CYNODONTEAE (CHLORIDEAE) in part *(Tetrapogon)* (p. 427)

19b Ligule a rim of hairs or a short ciliate membrane ..... **5. Chloridoideae**—2. ERAGROSTIDEAE (p. 426)

12b Spikelets arranged in open or contracted panicles, or in globose clusters:

20a Glumes reduced to minute scales or just represented by a tiny collar at the apex of the pedicel. Stamens 6. Spikelets strongly laterally compressed ..... **1. Bambusoideae**—4. ORYZEAE (p. 425)

20b Glumes, or at least 1 of them, fully developed. Stamens usually 3:

21a Spikelets strictly 1-flowered, but sometimes with the rachilla extended beyond the floret:

22a Lemmas subcylindric, indurated at maturity, with a 3-branched awn or rarely *(Aristida diminuta)* with a simple straight 7–10 mm long apical awn ..... **4. Arundinoideae**—2. ARISTIDEAE (p. 426)

22b Lemmas neither subcylindric nor indurated, awnless or awned, in the latter case the awn shorter than 5 mm or dorsally inserted:

23a Lemmas awnless. Glumes usually shorter than the lemmas and similar in texture. Caryopsis with a loose pericarp ..... **5. Chloridoideae**—2. ERAGROSTIDEAE (p. 426)

23b Lemmas awned or awnless. Glumes usually longer than the lemmas and firmer in texture. Caryopsis not with a loose pericarp ..... **2. Pooideae**—3. AVENEAE (AGROSTIDEAE) (p. 425)

21b Spikelets 2–many-flowered:

24a Spikelets with only 1 bisexual floret:

25a Spikelets with 2 florets; the lower one male or sterile; the upper one bisexual. Lemma of the bisexual floret usually awned ..... **6. Panicoideae**—3. ARUNDINELLEAE (p.429)

25b Spikelets with 3 florets; the lst and 2nd reduced to empty lemmas (sometimes 1 of them completely depressed). Lemma of the 3rd (bisexual) spikelet awnless:

26a Upper sterile lemma with a basal hinge-like appendage; both sterile lemmas as long as or longer than the bisexual floret ..... **1. Bambusoideae**—6. EHRHARTEAE (p. 425)

26b Upper sterile lemma without basal appendage; both sterile lemmas much shorter than the bisexual floret .... **2. Pooideae**—3. AVENEAE (PHALARIDEAE) (p. 425)

24b Spikelets with 2–many bisexual florets:

27a Spikelets 2-flowered, awnless, with at least 1 of the lemmas coriaceous .... **6. Panicoideae**—2. ISACHNEAE (p. 429)

27b Spikelets 3–many-flowered:

28a Glumes usually as long as the spikelet but always longer than the lowermost lemma, if shorter than lemmas then with dorsal or geniculate awns. Lemmas 5–many-nerved:

29a Lemmas dorsally awned (sometimes awnless in *Koeleria* but then with the inflorescence conspicuously pubescent or thinly tomentose) ..... **2. Pooideae**—3. AVENEAE (p. 425)

29b Lemmas awned between 2 apical lobes .... **4. Arundinoideae**—1. ARUNDINEAE (DANTHONIEAE) (p. 426)

28b Glumes shorter than the spikelet and almost always shorter than the lowermost lemma. Lemmas 1–many-nerved, awnless or with a straight apical awn:

30a Lemmas 1–3-nerved:

31a Spikelets awnless ..... **5. Chloridoideae**—2. ERAGROSTIDEAE (p.426)

31b Spikelets awned ..... **4. Arundinoideae**—1. ARUNDINEAE (DANTHONIEAE) (p. 426)

30b Lemmas 5–many-nerved:

32a Lemmas awned; the awns 20–43 mm long, twisted, becoming entangled with the awns from the other florets ..... **2. Pooideae** —2. MELICEAE (p. 425)

32b Lemmas awnless or with much shorter straight awns:

33a Ovary crowned by a pilose fleshy appendage above the insertion of the styles .... **2. Pooideae** —4. BROMEAE (p. 425)

33b Ovary pilose or glabrous, without a fleshy appendage ..... **2. Pooideae** —1. POEAE (p. 425)

6b Spikelets typically 2-flowered. falling entire at maturity, usually with the superior floret bisexual and the inferior one male or sterile, if sterile then often greatly reduced. Spikelets frequently dorsally compressed:

34a Spikelets usually solitary, sometimes paired, ± similar. Glumes usually membranous; the lower one usually smaller or sometimes absent. Lemma of the lower floret usually similar to the upper glume in texture; lemma of the upper floret hardened, chartaceous, coriaceous or crustaceous, awnless or rarely with a short straight awn ..... **6. Panicoideae**—1. PANICEAE (p. 428)

34b Spikelets typically paired, with 1 sessile and the other pedicelled, those of each pair similar or more often dissimilar (the pedicelled sometimes much reduced), rarely with the spikelets all similar. Glumes usually as long as the spikelets and enclosing the florets, somewhat rigid and firmer than the hyaline or membranous lemmas. Lemma of the upper floret often awned; the awn usually geniculate ..... **6. Panicoideae**—4. ANDROPOGONEAE (p. 430)

Keys to genera (arranged according to subfamilies and tribes)

1. Subfamily **Bambusoideae**

1. Bambuseae

1a Inflorescence determinate (semelauctant): a panicle or reduced to a raceme; stigmas 2:

2a Shrubs or small trees; anthers 3 ..... **Sinarundinaria**

2b Perennial herbs; anthers 6 ..... **Guaduella**

1b Inflorescence indeterminate (iterauctant): a cluster of pseudospikelets; stigmas 1 or 3:

3a Inflorescence a cluster of 1–many pseudospikelets sessile on a node; culm sheath blade very broad; lodicules 2 or 3 ..... ***Bambusa**

3b Inflorescence a globose or cup-shaped cluster of pseudospikelets on bare branches; culm sheath blade narrow, apex of leaves pungent; lodicules absent:

4a Filaments united; stigmas 3; glumes 2–4; inflorescence globose, spiky ..... **Oxytenanthera**
4b Filaments free; stigma 1; glume 1; inflorescence cup-shaped, surrounded by bracts forming a pseudo-involucre ..... **Oreobambos**

2. Phareae

Tribe represented only by **Leptaspis**

3. Olyreae

Tribe represented only by ***Olyra**

4. Oryzeae

Spikelets with 2 greatly reduced sterile lemmas beneath the fertile floret ..... **Oryza**
Spikelets without sterile lemmas beneath the floret ..... **Leersia**

5. Phyllorhachideae

Tribe represented only by **Phyllorhachis**

6. Ehrharteae

Tribe represented by its only genus: **Ehrharta**

2. Subfamily **Pooideae**

1. Poeae

1a Inflorescence a spike, with the spikelets arranged in 2 rows on alternate sides of the rachis ..... ***Lolium**
1b Inflorescence a panicle:
2a Lemmas very broad from a distinctly cordate base, not awned; spikelets 3–14 mm wide; annual plants ***Briza**
2b Lemmas lanceolate or ovate-lanceolate, never cordate at the base; spikelets usually smaller than above; perennial plants (except *Poa annua*):
3a Leaf blade with transverse veinlets ..... (=*Pseudobromus*) **Festuca**
3b Leaf blade without transverse veinlets:
4a Lemmas dorsally rounded (rarely slightly keeled towards the apex), awned or awnless ..... **Festuca**
4b Lemmas keeled, laterally compressed, not awned:
5a Spikelets solitary with pedicels swollen at apex ..... **Poa**
5b Spikelets crowded in dense shortly pedicelled clusters at ends of short main branches ..... ***Dactylis**

2. Meliceae

Tribe represented only by **Streblochaete**

3. Aveneae

1a Inflorescence a dense spike-like panicle ..... ***Phalaris**
1b Inflorescence an open or contracted panicle or raceme:
2a Floret 1 per spikelet:
3a Spikelet falling with glumes; lemma awnless or awned, central awn arising at or near apex ..... **Polypogon**
3b Spikelet disarticulating above the glumes; lemma awnless or awned, central awn arising well below the apex or at the base ..... **Agrostis**
2b Florets 2 or more per spikelet:
4a Lemmas awnless, sometimes mucronate; rachis of the (usually contracted) panicle conspicuously tomentose or densely pubescent ..... **Koeleria**
4b Lemmas all, or at least one in a spikelet, awned; rachis of the panicle glabrous or scabrous, if pilose than neither tomentose nor densely pubescent:
5a Lower lemma awnless; upper lemma with short hooked awn from back near apex; spikelets falling with glumes ..... ***Holcus**
5b All lemmas awned; spikelets disarticulating above the glumes:
6a Spikelets strictly 2-flowered, 2.0–4.5 mm long, with both florets bisexual; plants annual ..... ***Aira**
6b Spikelets at least 2–6-flowered, always longer than 5.5 mm; plants perennial or annual:
7a Spikelets with 3 florets; the first and second sterile, reduced to dorsally awned lemmas; the third bisexual, enveloped by the preceeding sterile ones ..... **Anthoxanthum**
7b Spikelets with 2–6 florets (the first 3 reduced), with all lemmas awned:
8a Glumes 7–11-nerved, often slightly cross-veined; weak annuals ..... ***Avena**
8b Glumes 1–3-nerved, never cross-veined; perennials ..... **Helictotrichon**

4. Bromeae

Tribe represented only by **Bromus**

5. Triticeae

Tribe represented only by **Brachypodium**

3. Subfamily **Centothecoideae**

Centotheceae

1a Lemmas awned ..... **Bromuniola**
1b Lemmas awnless:
2a Rachilla internodes fused to keels of adjacent palea; robust perennials ..... **Orthoclada**
2b Rachilla internodes free; annuals or short-lived perennials:
3a Spikelets 8–20-flowered, the apical florets similar but smaller ..... **Megastachya**
3b Spikelets 1–4-flowered, the terminal floret rudimentary ..... **Centotheca**

4. Subfamily **Arundinoideae**

1. Arundineae

1a Plants reed-like with distichous cauline leaves ..... **Phragmites**

1b Plants growing in tufts with basal leaves, not reed-like:

2a Lemma 5- or more-nerved:

3a Lemma often pilose on the back or flanks, but hairs not in tufts or lines, sometimes glabrous:

4a Inferior glume longer than the lowermost lemma ..... **Pentaschistis**

4b Inferior glume shorter than the lowermost lemma:

5a Awn much longer than lemma ..... **Piptophyllum**

5b Awn shorter than lemma ..... **Styppeiochloa**

3b Lemma with hairs in tufts or lines, rarely with a transverse band of longer hairs:

6a Floret callus pungent; lemma hairs in longitudinal lines ..... **Centropodia**

6b Floret callus obtuse; lemma hairs not in longitudinal lines:

7a Lowermost floret different from the rest, persisting with the glumes and resembling the upper floret, usually imperfect ..... **Alloeochaete**

7b Lowermost floret similar to the rest, different from the glumes ..... (=*Rytidosperma* in part) **Merxmuellera**

2b Lemma 1–3-nerved:

8a Inflorescence strongly condensed, the spikelets in dense globular clusters ..... **Elytrophorus**

8b Inflorescence open or loosely contracted, the spikelets not in clusters:

9a Awn shorter than the lemma ..... **Styppeiochloa**

9b Awn longer than the lemma ..... **Nematopoa**

2. Aristideae

1a Awns on lemma all, or only middle one, plumose; palea indurated ..... **Stipagrostis**

1b Awns on lemma all glabrous, smooth or scabrid; palea not indurated:

2a Upper glume 3–5-nerved; lower glume usually 3-nerved; glumes rounded on back; awns spirally contorted at base; caryopsis deeply grooved ventrally ..... **Sartidia**

2b Upper glume 1(3)-nerved; lower glume nearly always 1-nerved; glumes 1-keeled to middle or below; awns not spirally contorted at base; caryopsis not deeply grooved ..... **Aristida**

5. Subfamily **Chloridoideae**

1. Pappophoreae

1a Lemmas with 2(–4) awns ..... **Kaokochloa** (presence in Angola unconfirmed)

1b Lemmas with 7–11 awns or lobes:

2a Lemma 9-awned, with awns emerging from the apex of 9 hyaline lobes ..... **Enneapogon**

2b Lemma 5-awned, with the awns alternating with 4 hyaline lobes ..... **Schmidtia**

2. Eragrostideae

1a Lemmas 5–11-nerved in the upper part, the nerves disappearing or confluent below:

2a Spikelets disarticulating above the glumes but not between the florets ..... **Lintonia** (Cynodonteae)

2b Spikelets falling entire:

3a Lower florets sterile ..... **Entoplocamia**

3b Lower florets bisexual ..... **Fingerhuthia**

1b Lemmas 1–3-nerved throughout (rarely up to 7-nerved but then the spikelets disarticulating between the florets):

4a Spikelets with 1 fertile floret embedded in the rachis of a solitary raceme and covered by the upper glume; lower glume small or suppressed ..... **Oropetium**

4b Spikelets 1–many-flowered, if 1-flowered then not as above:

5a Spikelets strictly 1-flowered or occasionally with a rachilla extension; inflorescence a panicle:

6a Lemma with a long awn ..... **Hubbardochloa**

6b Lemma awnless:

7a Spikelets fusiform; glumes and lemma rounded on the back ..... **Sporobolus**

7b Spikelets strongly laterally compressed; glumes and lemmas keeled ..... ***Crypsis**

5b Spikelets 2- or more-flowered (if 1-flowered then the inflorescence composed of racemes):

8a Tip of lemma emarginate to 2- or 3-lobed, or flanks hairy between the lateral nerves and the margin, or nerves ciliate, or florets conspicuously bearded from the callus:

9a Leaf lamina rigid and pungent ..... **Odyssea**

9b Leaf lamina not conspicuously pungent though often rather stiff:

10a Inflorescence an open or contracted panicle:

11a Plants tall, with large plumose panicles:

12a Lemma long-ciliate on the lateral nerves ..... **Neyraudia**

12b Lemma glabrous or pilose on the back ..... **Phragmites**

11b Plants shorter and without large plumose panicles:

13a Lemma 3-awned ..... **Triraphis**

13b Lemma without or with a single awn, rarely the lateral awns excurrent to a mucro:

14a Lemma awnless ..... **Eragrostis**

14b Lemma awned:
15a Awn shorter than the lemma ..... **Tridens**
15b Awn longer than the lemma:
16a Glumes as long as the spikelet; floret callus square ..... **Habrochloa**
16b Glumes shorter than the spikelet, rarely longer but then floret callus linear ..... see ARUNDINEAE (p. 426)
10b Inflorescence composed of distinct racemes, these crowded in *Leptocarydion*, sometimes with short secondary branchlets in *Dinebra*:
17a Inflorescence of single racemes, these not deciduous ..... **Tripogon**
17b Inflorescence of 2–many racemes:
18a Racemes not deciduous:
19a Inferior glume not or only slightly exceeding the lowermost lemma:
20a Spikelets disarticulating above the glumes but not between the florets:
21a Lemmas awned from near the apex ..... **Tetrapogon** (Cynodonteae)
21b Lemmas awned from the back ..... **Bewsia**
20b Spikelets disarticulating between the florets, or rachilla persistent:
22a Uppermost floret or rudiment with a substantial terminal awn:
23a Inflorescence of digitate racemes ..... **Lophacme**
23b Inflorescence a dense feathery head of numerous crowded racemes ..... **Leptocarydion**
22b Uppermost floret awnless, rarely submucronate or very shortly awned:
24a Florets conspicuously bearded from the callus ..... **Halopyrum**
24b Florets not bearded from the callus:
25a Rachilla persistent, or upper part of spikelet shed as a whole; pericarp free ..... **Acrachne**
25b Rachilla disarticulating between the florets:
26a Raceme rachis terminating in a fertile spikelet:
27a Lemmas 3-nerved ..... **Leptochloa**
27b Lemmas 5–7-nerved ..... **Brachychloa**
26b Raceme rachis terminating in a naked bristle:
28a Spikelets pedicelled, loose; lemma 3-nerved ..... **Eragrostis**
28b Spikelets sessile, imbricate; lemma 1-nerved ..... **Richardsiella**
19b Inferior glume much longer than the lowermost lemma, often as long as the spikelet:
29a Lateral nerves of the lemma appressed-pubescent or rarely glabrous ..... **Dinebra**
29b Lateral nerves of the lemma conspicuously ciliate or villous ..... **Trichoneura**
18b Racemes (or secondary branchlets) deciduous:
30a Glumes as long as the spikelet, enclosing the florets ..... **Dinebra**
30b Glumes not or scarcely exceeding the adjacent lemmas ..... **Brachychloa**
8b Tip of lemma entire, the nerves and flanks glabrous (rarely the lemma ciliolate on the margin itself); florets not conspicuously bearded from the callus:
31a Inflorescence a panicle ..... **Eragrostis**
31b Inflorescence composed of 1 or more racemes:
32a Raceme a single "bottle brush" with reflexed spikelets ..... **Harpachne**
32b Racemes 2 or more:
33a Inflorescence digitate or ± whorled; fruit with free pericarp (otherwise see *Leptochloa*)
34a Racemes terminating in a fertile spikelet ..... **Eleusine**
34b Racemes terminating in an abortive spikelet or naked point:
35a Paleas, or some of them, remaining on the rachilla ..... **Acrachne**
35b Paleas falling with the lemmas:
36a Rachis terminating in abortive spikelets; leaf lamina terete ..... **Sclerodactylon**
36b Rachis terminating in a naked point; leaf lamina flat or involute ..... **Dactyloctenium**
33b Inflorescence of racemes disposed singly along a central axis:
37a Racemes deciduous (if glumes longer than florets see *Dinebra*) ..... **Pogonarthria**
37b Racemes persistent ..... **Eragrostis**

3. Leptureae

Tribe represented only by **Lepturus**

4. Cynodonteae

1a Spikelet containing 2–5 fertile florets:
2a Body of lemma 5–11-nerved ..... **Lintonia**
2b Body of lemma 3-nerved ..... **Tetrapogon**
1b Spikelets containing 1 fertile floret:
3a Racemes persistent; spikelets breaking up at maturity:
4a Lemma exposed; one or both glumes shorter than the florets:
5a Upper glume with an oblique dorsal awn:
6a Fertile floret without sterile lemmas below it ..... **Kampochloa**

6b Fertile floret with 2 sterile lemmas below it ..... **Ctenium**
5b Upper glume awnless or awned from near the apex:
7a Lemma sinuously awned ..... **Schoenefeldia**
7b Lemma awnless or with a straight awn:
8a Spikelets 2–several-flowered:
9a Lemma and caryopsis dorsally compressed ..... **Enteropogon**
9b Lemma laterally compressed; caryopsis trigonous to subterete:
10a Racemes solitary ..... **Harpochloa**
10b Racemes digitate:
11a Lemma awned, pallid; upper glume acute to 2-toothed ..... **Chloris**
11b Lemma awnless, dark brown; upper glume obtuse to 2-lobed ..... **Eustachys**
8b Spikelets 1-flowered:
12a Spikelets dorsally compressed ..... **Willkommia**
12b Spikelets laterally compressed:
13a Lemmas usually awned; glumes acute to truncate, erose ..... **Daknopholis**
13b Lemmas awnless; glumes acute ..... **Cynodon**
4b Lemma concealed; both glumes exceeding and closed around the florets:
14a Spikelets subterete to dorsally compressed:
15a Raceme 1 (rarely 2); rachis semiterete ..... **Microchloa**
15b Racemes several; rachis flat ..... **Craspedorhachis**
14b Spikelets laterally compressed:
16a Racemes borne upon an axis and crowded into a spiciform head ..... **Pogonochloa**
16b Racemes single or digitate:
17a Glumes thinner in texture than the lemma ..... **Chrysochloa**
17b Glumes firmer in texture than the lemma ..... **Brachyachne**
3b Racemes deciduous or spikelets falling entire:
18a Lower glume very small or suppressed; upper glume with the nerves forming raised ribs:
19a Upper glume awned; ribs on upper glume scaberulous ..... **Monelytrum**
19b Upper glume awnless; ribs on upper glume spinose ..... **Tragus**
18b Lower glume well-developed; upper glume not ribbed as above:
20a Racemelets comprising 2 or 3 spikelets separated by short rachis internodes ..... **Dignathia**
20b Racemelets comprising a single spikelet ..... **Perotis**

6. Subfamily **Panicoideae**

1. Paniceae

1a Spikelets, at least some, subtended by 1 to many bristles, spines or scales:
2a Bristles persisting on the axis after spikelets have fallen ..... **Setaria**
2b Bristles or scales falling with the spikelets:
3a Spikelets subtended by a single bristle and supported on a slender stipe ..... **Paratheria**
3b Spikelet surrounded by an involucre of bristles or scales, or bristle single and spikelet sessile:
4a Involucre composed of glumaceous bracts ..... **Anthephora**
4b Involucre composed of bristles or spines:
5a Bristles free throughout, ± filiform ..... **Pennisetum**
5b Bristles flattened and connate below:
6a Inflorescence spiciform ..... **Cenchrus**
6b Inflorescence with distant to ± crowded raceme-like branches ..... **Streptolophus**
1b Spikelets not subtended by bristles or scales:
7a Leaf surface raised into sinuous lamellae; plant aquatic ..... **Hydrothauma**
7b Leaf surface not lamellate:
8a Spikelets supported on a globular bead-like callus ..... **Eriochloa**
8b Spikelets without a basal bead, though sometimes with a short cylindric stipe:
9a Inflorescence a panicle, occasionally ± condensed about the primary branches:
10a Panicle cylindric, spiciform ..... **Sacciolepis**
10b Panicle open or contracted:
11a Spikelets dorsally compressed, rarely slightly gibbous:
12a Lower lemma awnless (if upper lemma tipped with a dark green spot or crest see *Acroceras*) ..... **Panicum**
12b Lower lemma awned:
13a Awn over 5 mm long ..... **Oryzidium**
13b Awn up to 1 mm long ..... **Hylebates**
11b Spikelets laterally compressed; lower glume absent or minute (up to 0.5 mm in *Sacciolepis*)
14a Upper lemma laterally compressed:
15a Lower glume reduced to a minute scale or rim or absent ..... **Melinis**

15b Lower glume well-developed, acute ..... **Cyrtococcum**
14b Upper lemma dorsally compressed:
16a Upper glume gibbous, distinctly ribbed ..... **Sacciolepis**
16b Upper glume neither gibbous nor ribbed ..... **Tricholaena**
9b Inflorescence consisting of 1-sided racemes, these either digitate or scattered along a central axis, rarely solitary; the racemes sometimes with short secondary branchlets (especially *Echinochloa crus-pavonis* and *Brachiaria malacodes*) or with the spikelets long-pedicelled and distant (*Brachiaria deflexa*):
17a Racemes very short, of 1–8 spikelets, ± impressed in a thickened axis ..... **Stenotaphrum**
17b Racemes free, appressed or divergent:
18a Upper lemma with a tiny green crest at the tip; upper glume and lower lemma ± thickened at the apex ..... **Acroceras**
18b Upper lemma not crested (sometimes mucronate or awned):
19a Spikelets laterally compressed or the lower glume awned:
20a Upper lemma dorsally compressed; lower glume awned ..... **Oplismenus**
20b Upper lemma laterally compressed; lower glume usually awnless:
21a Upper glume neither gibbous nor armed with hooks; inferior glume shorter than the spikelet ..... **Poecilostachys**
21b Upper glume gibbous, armed with hooks at maturity; lower glume ± as long as the spikelet ..... **Pseudechinolaena**
19b Spikelets dorsally compressed, the lower glume at most with a short awn-point:
22a Upper lemma coriaceous to crustaceous, with narrow inrolled margins clasping only edges of palea; sometimes thinner but then margins inrolled:
23a Lower glume absent (rarely represented by a tiny triangular scale on some of the spikelets):
24a Back of upper lemma facing the rachis; spikelets strongly plano-convex and often orbicular ..... **Paspalum**
24b Back of upper lemma turned away from the rachis ..... **Axonopus**
23b Lower glume present:
25a Upper lemma hairy ..... **Entolasia**
25b Upper lemma glabrous:
26a Upper lemma awned, crisply chartaceous ..... **Alloteropsis**
26b Upper lemma at most mucronate, coriaceous to crustaceous:
27a Spikelets paired or in racemelets:
28a Tip of upper palea reflexed and slightly protuberant; spikelets cuspidate to awned, usually in 4 rows ..... **Echinochloa**
28b Tip of upper palea not reflexed:
29a Upper lemma as long as the spikelet, acute, obtuse or rarely mucronulate; spikelets plump, obtuse to acute ..... **Brachiaria**
29b Upper lemma shorter than the spikelet, broadly obtuse with a mucro 0.5–1.0 mm long; spikelets plano-convex, cuspidate ..... **Urochloa**
27b Spikelets borne singly:
30a Lower glume turned towards the rachis:
31a Upper floret sessile ..... **Brachiaria**
31b Upper floret stipitate; upper glume and lower lemma resembling woven fabric ..... **Eccoptocarpha**
30b Lower glume turned away from the rachis:
32a Upper lemma shorter than the spikelet, broadly obtuse, nearly always mucronate ..... **Urochloa**
32b Upper lemma as long as the spikelet, acute ..... **Paspalidium**
22b Upper lemma cartilaginous, with flat, thin margins covering most of the palea and often overlapping:
33a Spikelets awned:
34a Racemes digitate ..... **Stereochlaena**
34b Racemes single or borne along a central axis:
35a Racemes single ..... **Baptorhachis**
35b Racemes borne along a central axis ..... **Acritochaete**
33b Spikelets awnless:
36a Lower glume as long as the spikelet ..... **Megaloprotachne**
36b Lower glume shorter than the spikelet or suppressed ..... **Digitaria**

2. Isachneae

1a Inflorescence of racemes ..... **Heteranthoecia**
1b Inflorescence a panicle:
2a Upper lemma becoming crisply chartaceous to crustaceous; glumes deciduous ..... **Isachne**
2b Upper lemma remaining membranous, thinner than the lower one; glumes persistent ..... **Coelachne**

3. Arundinelleae

1a Ligule shortly membranous; hilum round ..... **Arundinella**
1b Ligule a line of hairs; hilum linear; upper lemma hairy or quite smooth:
2a Lower lemma 3-nerved:
3a Lobes of upper lemma awned, with a tuft of hairs below each lobe ..... **Trichopteryx**
3b Lobes of upper lemma awnless (if with hair tufts see *Danthoniopsis*):

4a Spikelets paired or single, rarely in loose groups of three with long pedicels ..... **Loudetia**
4b Spikelets in close triads ..... **Loudetiopsis**
2b Lower lemma 5–9-nerved:
5a Spikelets in groups of 3 with connate pedicels; if upper lemma hairy then hairs not in tufts:
6a Callus of upper floret conical, pungent ..... **Tristachya**
6b Callus of upper floret short, broadly rounded ..... **Zonotriche**
5b Spikelets with free pedicels; upper lemma with tufts of hair across the back:
7a Palea of inferior floret woody at maturity; inferior glume awned ..... **Gilgiochloa**
7b Palea of inferior floret membranous; inferior glume obtuse to acuminate; hair tufts on upper lemma 6–8 ..... **Danthoniopsis**

4. Andropogoneae

1a Inflorescence branches each subtended by a smooth ivory-like bead or cupule enclosing female spikelets; male spikelets on a tassel exserted from the bead; annuals ..... ***Coix**
1b Inflorescence branches not subtended by a smooth ivory-like bead or cupule; annuals or perennials:
2a Rachis internodes and pedicels slender, filiform or linear, rarely thickening upwards and then the upper lemma awned or the callus fulvously barbate:
3a Upper lemma awned from low down on the back ..... **Arthraxon**
3b Upper lemma awnless or awned from the apex or from the sinus of a bilobed apex:
4a Spikelets all alike or nearly so:
5a Inflorescence a panicle with elongated central axis:
6a Panicle branches distally fragile; one spikelet of each pair sessile:
7a Callus hairs rufous or tawny; racemes short, dense ..... **Eriochrysis**
7b Callus hairs silvery; racemes long, loose:
8a Callus hairs much longer than the spikelet ..... **Saccharum**
8b Callus hairs shorter than the spikelet ..... **Sorghastrum**
6b Panicle branches tough; all spikelets pedicelled:
9a Callus pubescent, the hairs less than $^1/_4$ the length of the spikelet ..... **Cleistachne**
9b Callus conspicuously barbate, the hairs at least $^1/_4$ the length of the spikelet:
10a Panicle loose, the component racemes distinct ..... **Miscanthus**
10b Panicle spiciform ..... **Imperata**
5b Inflorescence of 1–many subdigitate racemes:
11a Callus acutely conical to pungent; rachis fragile (if tough see *Trachypogon*) ..... **Homozeugos**
11b Callus obtuse:
12a Lower glume convex or concave, often villous ..... **Eulalia**
12b Lower glume medianly grooved, glabrous or ciliate only at the apex ..... **Microstegium**
4b Spikelets of each pair significantly different, sometimes the pedicelled spikelet rudimentary or represented only by its pedicel:
13a Sessile spikelet male or sterile, the pedicelled spikelet fertile ..... **Trachypogon**
13b Sessile spikelet fertile, the pedicelled spikelet male, sterile or suppressed:
14a Inflorescence a panicle with an elongated central axis, not supported by spatheoles:
15a Sessile spikelets laterally compressed or terete ..... **Chrysopogon**
15b Sessile spikelets dorsally compressed:
16a Pedicels sterile ..... **Sorghastrum**
16b Pedicels all bearing spikelets:
17a Rachis internodes and pedicels solid ..... **Sorghum**
17b Rachis internodes and pedicels with a translucent or balsamiferous, sometimes purple-tinged, median line:
18a Racemes composed of 1 or 2 sessile spikelets ..... **Capillipedium**
18b Racemes composed of 10 or more sessile spikelets ..... **Bothriochloa**
14b Inflorescence of single, paired or subdigitate racemes, often supported by spatheoles:
19a Fertile lemma awned from its entire apex:
20a Racemes composed of a single awned sessile spikelet and 2 pedicelled spikelets, enclosed by an involucre of 4 sterile spikelets ..... **Themeda**
20b Racemes composed of many pairs of spikelets:
21a Callus pungent ..... **Heteropogon**
21b Callus obtuse (but if inflorescence a dense spatheate head see *Cymbopogon densiflorus*):
22a Rachis internodes and pedicels solid ..... **Dichanthium**
22b Rachis internodes and pedicels with a translucent or balsamiferous, sometimes purple-tinged, median line:
23a Racemes erect or divergent, without homogamous pairs ..... **Bothriochloa**
23b Racemes nodding, with 1–3 homogamous pairs at the base ..... **Euclasta**
19b Fertile lemma awned from the sinus of its bilobed apex, rarely awnless (lemma entire in *Andropogon brazzae* and *Schizachyrium lopollense*):
24a Lower glume of sessile spikelet transversely rugose; pedicelled spikelet represented only by a narrow curved pedicel ..... **Thelepogon**

24b Lower glume of sessile spikelet smooth, rarely rugose and then the pedicelled spikelet well-developed:
25a Callus of sessile spikelet inserted into the crateriform or cupuliform apex of the internode, at least the rim of the internode lapping over and concealing the tip of the callus; lower glume of sessile spikelet 2-keeled or with the margins sharply inflexed and usually depressed between the keels, rarely the flanks abruptly rounded but then deeply grooved between them:
26a Lower floret of sessile spikelet male, with a well-developed palea:
27a Racemes paired or digitate (rarely single but than the upper glume neither awned nor crested) ..... **Ischaemum**
27b Racemes single:
28a Glumes inconspicuously winged, the upper one awned ..... **Sehima**
28b Glumes with a prominent wing-like crest, muticous ..... **Andropterum**
26b Lower floret of sessile spikelet sterile and reduced to a lemma:
29a Callus of sessile spikelet acute to pungent, 1–5 mm long ..... **Diheteropogon**
29b Callus of sessile spikelet obtuse, usually very short:
30a Racemes single; lower glume of sessile spikelet with several intercarinal nerves ..... **Schizachyrium**
30b Racemes paired or digitate, rarely single and then the lower glume of the sessile spikelet nerveless between the keels:
31a Racemes not deflexed, borne on unequal terete raceme-bases; leaves not aromatic ..... **Andropogon**
31b Racemes deflexed at maturity, borne on subequal flattened raceme-bases, seldom longer than the spatheole; rachis internodes and pedicels linear; leaves aromatic; panicle dense, decompound ..... **Cymbopogon**
25b Callus of sessile spikelet applied obliquely to the apex of the internode with its tip free, usually acute to pungent; lower glume of sessile spikelet convexly rounded on the back without keels (rarely with a median groove); internodes and pedicels linear:
32a Racemes paired, rarely single, but then the pedicelled spikelet without a callus:
33a Lower glume of sessile spikelet with a median groove ..... **Hyperthelia**
33b Lower glume of sessile spikelet convex on the back:
34a Upper glume of sessile spikelet awned ..... **Elymandra**
34b Upper glume of sessile spikelet awnless:
35a Upper raceme-base up to 10 mm long, but usually much shorter ..... **Hyparrhenia**
35b Upper raceme-base 15–25 mm long; homogamous pairs 2 at the base of each raceme, forming an involucre ..... **Exotheca**
32b Racemes single; pedicelled spikelet with a distinct, narrowly oblong to linear callus:
36a Spatheoles linear to narrowly lanceolate; racemes loose, the internode visible ..... **Anadelphia**
36b Spatheoles boat-shaped; racemes dense, the internodes concealed ..... **Monocymbium**

2b Rachis internodes and pedicels stout, thickening upwards; upper lemma awnless:
37a Pedicels distinct:
38a Lower glume of sessile spikelet produced into a long flattened tail; spikelets similar ..... **Vossia**
38b Lower glume of sessile spikelet without a herbaceous tail:
39a Pedicelled spikelet long-awned (10–120 mm) from the lower glume, rarely awnless; racemes obliquely jointed and callus without a central peg ..... **Urelytrum**
39b Pedicelled spikelet awnless or with an awnlet up to 5 mm long:
40a Racemes many, on a short common axis; callus with a short central peg ..... **Phacelurus**
40b Racemes single:
41a Jointing of racemes oblique:
42a Callus inserted in the crateriform internode, the node fringed with a ring of hairs; lower glume of sessile spikelet usually longitudinally ridged, entire ..... **Loxodera**
42b Callus not inserted in the internode; lower glume of sessile spikelet not ridged, often bifid ..... **Elionurus**
41b Jointing of racemes transverse:
43a Ligule a fringe of hairs; inflorescence axillary; lower floret male ..... **Chasmopodium**
43b Ligule membranous:
44a Lower glume of sessile spikelet not (or rarely very obscurely) winged ..... **Rhytachne**
44b Lower glume of sessile spikelet conspicuously winged ..... **Coelorachis**
37b Pedicels fused to the internode, rarely absent:
45a Lower glume of sessile spikelet smooth:
46a Raceme dorsally compressed, tough ..... **Hemarthria**
46b Raceme cylindric, fragile:
47a Pedicelled spikelet present ..... **Rottboellia**
47b Pedicelled spikelet absent ..... **Oxyrhachis**
45b Lower glume of sessile spikelet rough:
48a Sessile spikelet broadly elliptic ..... **Heteropholis**
48b Sessile spikelet globose ..... **Hackelochloa**

Acrachne Wight & Arn. ex Chiov.

(Chloridoideae—Eragrostideae—Eleusininae)

Gibbs Russell *et al.*: 31 (1990); Cope: 159 (1999).

Sthn trop. Afr. 1: *Acrachne racemosa* (B.Heyne ex Roem. & Schult.) Ohwi, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Acritochaete Pilg.

(Panicoideae—Paniceae—Digitariinae)

Pilger: 53 (1902); Simon: 63 (1971); Clayton & Renvoize: 658 (1982).

Straggling annuals, decumbent at base and rooting at lower nodes; culms weak. **Leaf blades** broadly linear to narrowly lanceolate; *ligule* membranous. **Inflorescence** composed of racemes borne along a central axis; rachis triquetrous, bearing solitary pedicellate spikelets. **Spikelets** narrowly lanceolate, dorsally compressed; *lower glume* adaxial, ovate, ± 1/5 as long as spikelet; *upper glume* slightly shorter than spikelet, awned; *lower floret* sterile, represented by a membranous lemma as long as spikelet and terminating in a flexuose awn; *upper lemma* chartaceous, acuminate to aristulate, its flat thin margins enfolding and concealing the palea. **Caryopsis** narrowly oblong.

Monotypic genus: *Acritochaete volkensii* Pilg., mountains of trop. Africa; sthn trop. Afr.: Zambia.

Acroceras Stapf

(Panicoideae—Paniceae—Setariinae)

Clayton: 557 (1980); Clayton & Renvoize: 564 (1982); Clayton: 48 (1989).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Agrostis L.

(Pooideae—Aveneae—Alopecurinae)

Launert: 86 (1971); Gibbs Russell *et al.*: 32 (1990).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

***Aira** L.

(Pooideae—Aveneae—Aveninae)

Launert: 79 (1971).

Sthn trop. Afr. 1: **Aira caryophyllea* L., introduced weed, Malawi, and sthn Afr.

Alloeochaete C.E.Hubb.

(Arundinoideae—Arundineae)

Hubbard: t. 3418 (1940a); Renvoize & Kabuye: 569 (1975); Clayton & Renvoize: 176 (1986); Watson & Dallwitz: 88 (1993); Cope: 9 (1999); Strugnell: 18 (2002).

Caespitose to tall tussocky perennials. **Leaves**: sheaths often lanate, or striate and breaking up into fibres; lamina flat, involute or convolute. **Inflorescence** an open or contracted panicle. **Spikelets** (4)5–10-flowered; *glumes* unequal, shorter than the lowermost lemma, acute, acuminate or 2-lobed and shortly awned; *lowermost floret* male or with a rudimentary or rarely a perfect ovary, persisting on panicle with the glumes, *lemma* resembling upper glume or deeply 2-lobed with aristate lobes and awned from the sinus; *floret callus* oblong; *fertile lemmas* dorsally rounded, 5-nerved, glabrous or pilose above, with a tuft of hairs on each margin below, 2-lobed at apex, lobes aristate, with a geniculate *awn* in sinus; *palea* ± as long as body of lemma, keels narrowly winged, ciliolate.

Species 6, trop. Africa: sthn trop. Afr. 5, Angola, Malawi, Mozambique.

Alloteropsis J.Presl

(Panicoideae—Paniceae—Setariinae)

Clayton & Renvoize: 615 (1982); Clayton: 58 (1989); Gibbs Russell *et al.*: 36 (1990).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anadelphia Hack.

(Panicoideae—Andropogoneae—Anthistiriinae)

Hackel: 240 (1885); Clayton: 275 (1966a); Clayton & Renvoize: 358 (1986); Watson & Dallwitz: 103 (1994); Cope: 141 (2002).

Pobeguinea (Stapf) Jacq.-Fél.; Koechlin: 193 (1962).

Annuals or perennials. **Leaf blade** linear; *ligule* a short ciliolate membrane. **Inflorescence** a solitary raceme, exserted from or enclosed by a narrow spatheole and gathered into a scanty or copious false panicle; raceme loose, with few spikelets (sometimes only 1), without homogamous spikelet pairs; internodes and pedicels long and slender. **Sessile spikelet** slightly dorsally compressed to subterete; *callus* usually pungent, applied obliquely to apex of internode with its tip free. **Glumes**: inferior one grooved on back or not; superior one usually awned. **Lower floret** reduced to a hyaline lemma; *upper lemma* bilobed, passing between lobes into a glabrous to pubescent awn. **Caryopsis** narrowly ellipsoid to subcylindrical. **Pedicelled spikelet** as long as sessile one, linear-lanceolate, acuminate, usually glabrous, with narrowly oblong to linear *callus*, sometimes spikelet much reduced or quite absent and its pedicel likewise much reduced

Species 14. Senegal to Mozambique; sthn trop. Afr. 2, Zambia, Mozambique.

Andropogon L.

(Panicoideae—Andropogoneae—Andropogoninae)

Clayton & Renvoize: 767 (1982); Gibbs Russell *et al.*: 38 (1990); Chapano: 15 (2002); Sales: 60 (2002).

Sthn trop. Afr. ± 20. Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Andropterum Stapf

(Panicoideae—Andropogoneae—Ischaeminae)

Stapf: 38 (1917); Clayton & Renvoize: 348 (1986); Watson & Dallwitz: 111 (1994); Cope: 58 (2002).

Rambling perennials, rooting at nodes. **Leaf blade** broadly linear, flat, acuminate to a fine pungent apex; ligule a line of hairs. **Inflorescence** of solitary, terminal and axillary racemes; rachis internodes and pedicels swollen, ± clavate, ciliate. **Sessile spikelet** laterally compressed; *callus* obtuse and fitting concave top of internode; *lower glume* cartilaginous, 2-keeled, keels dorsal, almost contiguous, separated by a narrow groove,

not winged; *upper glume* strongly laterally compressed, conspicuously winged on keel towards apex; *lower floret* male, with hyaline lemma and well-developed palea; *upper lemma* bifid, passing between teeth into a glabrous *awn*. **Caryopsis** narrowly ellipsoid. **Pedicelled spikelet** larger than sessile one, glabrous, asymmetrically winged, awnless, conspicuous.

Monotypic genus: *Andropterum stolzii* (Pilg.) C.E.Hubb., trop. Africa; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique.

Anthephora Schreb.

(Panicoideae—Paniceae—Cenchrinae)

Clayton & Renvoize: 660 (1982); Clayton: 190 (1989).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Anthoxanthum L.

(Pooideae—Aveneae—Phalaridinae)

Launert: 72 (1971).

Sthn trop. Afr. 1(2): *Anthoxanthum ecklonii* (Nees) Stapf, Malawi, and sthn Afr.; **A. odoratum* L. is naturalised in Zimbabwe (Chapano 2002: 3).

Aristida L.

(Arundinoideae—Aristideae)

Rendle: 202 (1899); Henrard: 1 (1926–1933); Melderis: 97 (1971); Gibbs Russell *et al.*: 45 (1990); Chapano: 4 (2002).

Sthn trop. Afr. ± 30, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Arthraxon P.Beauv.

(Panicoideae—Andropogoneae—Andropogoninae)

Stapf: 162 (1917); Clayton & Renvoize: 741 (1982); Van Welzen: 101 (1993); Sales: 89 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Arundinella Raddi

(Panicoideae—Arundinelleae)

Hubbard: 1 (1937); Hubbard: 407 (1974); Bennett: 197 (1980); Clayton: 199 (1989).

Sthn trop. Afr. 1: *Arundinella nepalensis* Trin., Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

***Avena** L.

(Pooideae—Aveneae—Aveninae)

Launert: 74 (1971); Simon: 23 (1971); Gibbs Russell *et al.*: 58 (1990); Chapano: 3 (2002); Phiri (Unpublished).

Sthn trop. Afr. 3 or more, introduced, ± cosmopolitan weeds, Zambia, Zimbabwe, and sthn Afr.

Axonopus P.Beauv.

(Panicoideae—Paniceae—Setariinae)

Koechlin: 36 (1962); Clayton: 446 (1972); Clayton & Renvoize: 612 (1982); Clayton & Renvoize: 289 (1986); Clayton: 91 (1989); Watson & Dallwitz: 160 (1994).

Sthn trop. Afr. 3, 1: *Axonopus flexuosus* (Peter) Troupin, probably native to Africa, the other 2 introduced, Angola, Zambia, Zimbabwe, and sthn Afr.

***Bambusa** Schreb.

(Bambusoideae—Bambuseae—Bambusinae)

Clayton & Renvoize: 53 (1986); Gibbs Russell *et al.*: 60 (1990); Chapano: 2 (2002).

Sthn trop. Afr. 1: **Bambusa balcooa* Roxb. ex Roxb., cultivated and naturalised, also in sthn Afr.

Baptorhachis Clayton & Renvoize

(Panicoideae—Paniceae—Digitariinae)

Clayton & Renvoize: 377 (1986); Clayton: 130 (1989); Watson & Dallwitz: 163 (1994); Izidine & Bandeira: 51 (2002).

Stereochlaena foliacea Clayton: 295 (1978c).

Laxly caespitose annuals with ascending culms. **Leaf blade** flat, sparsely pilose. **Inflorescence** of 1 (or 2(3) digitately arranged) raceme(s) with broad, colourful, foliaceous rachis, bearing paired spikelets. **Spikelets** elliptic-oblong, glabrous; *upper glume* and *lower lemma* as long as spikelet, 3-nerved, the laterals thickened and bearing a tuft of hair near base, bilobed with an *awn* from the sinus; *lower glume* minute; *upper lemma* cartilaginous, acute, with flat, thin margins enfolding and concealing palea.

Monotypic genus: *Baptorhachis foliacea* (Clayton) Clayton, only known from Mozambique.

Bewsia Gooss.

(Chloridoideae—Eragrostideae—Eleusininae)

Simon: 26, 60 (1971); Gibbs Russell *et al.*: 61 (1990); Cope: 36 (1999).

Sthn trop. Afr. 1: *Bewsia biflora* (Hack.) Gooss., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Bothriochloa Kuntze

(Panicoideae—Andropogoneae—Sorghinae)

Clayton & Renvoize: 719 (1982); Gibbs Russell *et al.*: 62 (1990); Setshogo: 130 (2000); Setshogo: 44 (2002).

Amphilophis Nash; Stapf: 171 (1917).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Brachiaria (Trin.) Griseb.

(Panicoideae—Paniceae—Setariinae)

Clayton: 558 (1980); Clayton & Renvoize: 575 (1982); Clayton: 62 (1989); Gibbs Russell *et al.*: 63 (1990); Chapano: 10 (2002).

Leucophrys Rendle; Fish: 702 (2000).

Sthn trop. Afr. ± 33, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Brachyachne (Benth.) Stapf

(Chloridoideae—Cynodonteae—Chloridinae)

Simon: 24, 58 (1971); Gibbs Russell *et al.*: 68 (1990); Cope: 238 (1999).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Brachychloa S.M.Phillips

(Chloridoideae—Eragrostideae—Eleusininae)

Gibbs Russell *et al.*: 69 (1990); Cope: 47 (1999).

Sthn trop. Afr. 2, coastal Mozambique, and sthn Afr.

Brachypodium P.Beauv.

(Pooideae—Triticeae)

Launert: 62 (1971); Simon: 24, 58 (1971); Gibbs Russell *et al.*: 70 (1990).

Sthn trop. Afr. 1: *Brachypodium flexum* Nees, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Briza** L.

(Pooideae—Poeae)

Launert: 45 (1971); Simon: 36 (1971).

Sthn trop. Afr. 2, introduced into parts of trop. Africa, including Zimbabwe and sthn Afr.

Bromuniola Stapf & C.E.Hubb.

(Centothecoideae—Centotheceae)

Stapf & Hubbard: 366 (1926); Launert: 143 (1971); Clayton & Renvoize: 162 (1986); Watson & Dallwitz: 187 (1994).

Caespitose perennials from a creeping rhizome. **Leaf blade** expanded, constricted at base, lanceolate or lanceolate-elliptic, tapering to an acute apex. **Inflorescences** of large panicles with spreading, lax, delicate branches. **Spikelets** long-pedicelled, solitary, laterally compressed, loosely imbricate, 3–7-flowered, awned. **Florets** all fertile, bisexual except for reduced terminal one; rachilla disarticulating above glumes and beneath florets; *glumes* subequal, persistent, keeled, membranous, acute, prominently 5-nerved, with transverse veinlets between nerves, scaberulous along keels, glabrous, often mucronate; *lemmas* similar to glumes, 7-nerved, acute and shortly awned, keeled, glabrous and smooth except for scaberulous keels and awns, membranous with hyaline margins, glabrous, lowermost one sterile; *paleas* slightly shorter than lemmas, 2-keeled, hyaline, compressed, apex obtuse, base bulging out from lemma, ciliate along keels. **Lodicules** 2, broadly cuneate. **Stamens** 3. **Ovary** elliptic, glabrous; styles distinct, short; stigmas plumose, laterally exserted. **Caryopsis** free, obliquely ovate in outline, laterally compressed; embryo very small; hilum basal.

Monotypic: *Bromuniola gossweileri* Stapf & C.E.Hubb., trop. Africa; sthn trop. Afr. Angola, Zambia.

Bromus L.

(Pooideae—Bromeae)

Clayton: 66 (1970); Launert: 59 (1971); Simon: 24 (1971); Gibbs Russell *et al.*: 73 (1990); Chapano: 4 (2002).

Sthn trop. Afr. 6, of which 4 are introduced, Zimbabwe, Malawi, and sthn Afr.

Capillipedium Stapf

(Panicoideae—Andropogoneae—Sorghinae)

Stapf: 11, 169 (1917); Clayton & Renvoize: 343 (1986); Watson & Dallwitz: 202 (1994); Setshogo: 130 (2000); Chapano: 15 (2002); Setshogo: 42 (2002).

Caespitose perennials, mostly rambling; culms mostly with barbate nodes. **Leaf blade** erect and straight, linear, flat, scabrid on margins, finely pointed at apex; sheath tight or eventually slipping from culm, ± covered in tubercle-based hairs and frequently villous on collar; *ligule* a very short, truncate, ciliolate membrane. **Inflorescence** a delicate loose panicle bearing short, 1–5(8)-jointed racemes at ends of capillary branches and branchlets; rachis internodes and pedicels filiform with a translucent longitudinal groove; racemes mostly reduced to a single sessile spikelet. **Sessile spikelet** with obtuse *callus*; *lower glume* cartilaginous, broadly convex to slightly concave, acute or obtuse; *upper lemma* forming the hyaline base to its awn, entire; *awn* glabrous. **Pedicelled spikelet** male or neuter.

Species ± 14, in eastern Africa through tropical Asia to Australia; sthn trop. Afr. 1: *Capillipedium parviflorum* (R.Br.) Stapf, Zambia, Zimbabwe, Malawi, Mozambique.

Cenchrus L.

(Panicoideae—Paniceae—Cenchrinae)

Stapf & Hubbard: 1070 (1934); Clayton & Renvoize: 691 (1982); Clayton: 186 (1989); Gibbs Russell *et al.*: 79 (1990).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Centotheca Desv.

(Centothecoideae—Centotheceae)

Desvaux: 189 (1810); Clayton: 381 (1972); Clayton & Renvoize: 160 (1986); Phiri (Unpublished).

Annuals. **Leaves**: blades broadly linear to lanceolate, narrowed at base. **Inflorescence** a panicle, or primary branches reduced to racemes. **Spikelets** 1–4-flowered, plus rachilla extension bearing a rudimentary floret, breaking up at maturity; upper florets decreasing in size; lemmas emarginate and apiculate, lowest glabrous, upper one with reflexed, tubercle-based bristles serving as dispersal device. **Stamens** 2.

Species 4, tropics of Old World and Pacific islands; sthn trop. Afr. 1: *Centotheca lappacea* (L.) Desv., Angola, Zambia.

Centropodia Rchb.

(Arundinoideae—Arundineae)

Cope: 657 (1983a); Ellis: 41 (1989); Gibbs Russell *et al.*: 80 (1990); Scholz: 445 (1990); Cope: 12 (1999).

Asthenatherum Nevski.

Sthn trop. Afr. 1: *Centropodia mossamedensis* (Rendle) T.A.Cope, Angola, and sthn Afr.

Chasmopodium Stapf

(Andropogoneae—Rottboelliinae)

Stapf: 76 (1917); Clayton: 509 (1972); Clayton: 49 (1973b); Scholz: 5 (1977); Dujardin: 373 (1978); Clayton & Renvoize: 365 (1986).

Rottboellia L.f., in part; *Robynsiochloa* Jac.-Fél.

Robust annuals or perennials, sparingly branched. **Leaves**: blades lanceolate-linear, broad; *ligule* a fringe of hairs. **Inflorescence** axillary, a single subcylindric dorsiventral raceme

with paired spikelets; internodes squatly clavate, shorter than spikelets. **Sessile spikelet**: callus truncate, with large central knob; lower glume oblong-ovate, crustaceous, smooth, pallid, narrowly winged on keels above; lower floret male, with palea; embryo 4/5 as long as caryopsis. **Pedicelled spikelet** well-developed; pedicel free, stout.

Species 3, tropical W Africa; sthn trop. Afr. 1: *Chasmopodium purpurascens* (Robyns) Clayton, Angola, Zambia.

Chloris Sw.

(Chloridoideae—Cynodonteae—Chloridinae)

Gibbs Russell *et al.*: 82 (1990); Cope: 209 (1999); Chapano: 8 (2002).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Chrysochloa Swallen

(Chloridoideae—Cynodonteae—Chloridinae)

Swallen: 44 (1941); Simon: 58 (1971); Renvoize: 327 (1974); Clayton & Renvoize: 243 (1986); Watson & Dallwitz: 238 (1994); Cope: 238 (1999).

Stoloniferous annuals, sometimes caespitose, erect or geniculately ascending. **Leaves**: sheaths strongly keeled; lamina flat, broadly obtuse at apex and with a reflexed mucro. **Inflorescence** of 1–many digitate, 1-sided racemes bearing imbricate spikelets on a flat rachis. **Spikelets** 2-flowered, strongly laterally compressed, sessile, in 1 row on a tough axis, disarticulating above glumes; *glumes* subequal, membranous, keeled, enclosing florets, acute to acuminate at apex, *upper glume* deciduous, sometimes with a short awn; *fertile lemma* coriaceous, keeled, mucronate or with a short subapical *awn*; *distal floret* well-developed but male or sterile and smaller than the fertile one. **Caryopsis** ellipsoid, trigonous.

Species 4, trop. Africa; sthn trop. Afr. 1: *Chrysochloa hindsii* C.E.Hubb., Zambia and Malawi.

Chrysopogon Trin.

(Panicoideae—Andropogoneae—Sorghinae)

Clayton & Renvoize: 736 (1982); Veldkamp: 503 (1999); Setshogo: 134 (2000); Setshogo: 34 (2002).

Vetiveria Bory; Stapf: 156 (1917); Clayton & Renvoize: 739 (1982); Veldkamp: 503 (1999); Setshogo: 134 (2000).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cleistachne Benth.

(Panicoideae—Andropogoneae—Sorghinae)

Simon: 20, 54 (1971); Clayton & Renvoize: 734 (1982); Setshogo: 134 (2000); Setshogo: 32 (2002).

Monotypic genus: *Cleistachne sorghoides* Benth., tropical Africa, India; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Coelachne R.Br.

(Panicoideae—Isachneae)

Brown: 187 (1810); Simon: 29, 63 (1971); Hubbard: 436 (1974); Clayton & Renvoize: 310 (1986); Clayton: 195 (1989); Watson & Dallwitz: 252 (1994); Lebrun & Stork: 231 (1995).

Mat-forming perennials; culms up to 0.2 m high, ascending from a creeping base and rooting at nodes. **Leaf blades** narrowly lanceolate; *ligule* a line of hairs or absent. **Inflorescence** a sparse panicle, sometimes spike-like. **Spikelet** 2-flowered. **Florets** dissimilar, the lower bisexual, the upper female, gaping at maturity, separated by a slender internode. **Glumes** persistent, subequal, $^1/_3$–$^2/_3$ as long as spikelet, obtuse. **Lemmas**: lower one firmly cartilaginous; upper one remaining membranous at maturity, $^2/_3$ to almost as long as lower one. **Stamens** 2 or 3. **Caryopsis** ovoid.

Species 10, Old World tropics; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Coelorachis Brongn.

(Panicoideae—Andropogoneae—Rottboelliinae)

Stapf: 78 (1917); Clayton & Renvoize: 840 (1982) as *Coelorhachis*; Gibbs Russell *et al.*: 88 (1990); Cope: 172 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Coix L.

(Panicoideae—Andropogoneae—Coicinae)

Stapf: 27 (1917); Clayton & Renvoize: 857 (1982); Clayton & Renvoize: 373 (1986); Gibbs Russell *et al.*: 89 (1990); Watson & Dallwitz: 256 (1994); Chapano: 17 (2002); Cope: 1 (2002).

Sthn trop. Afr. 1: **Coix lacryma-jobi* L., an Asiatic species now widely distributed throughout the region. Also naturalised in sthn Afr.

Craspedorhachis Benth.

(Chloridoideae—Cynodonteae—Chloridinae)

Gibbs Russell *et al.*: 92 (1990); Cope: 219 (1999); Chapano: 8 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Crypsis Aiton

(Chloridoideae—Eragrostideae—Sporobolinae)

Aiton: 48 (1789) name conserved; Clayton: 351 (1974); Hammel & Reeder: 267 (1979); Clayton & Renvoize: 225 (1986); Watson & Dallwitz: 270 (1994); Cope: 198 (1999).

Annuals with culms profusely branched from base, at first prostrate, finally ascending. **Leaves**: sheath margins glabrous or pilose; lamina glaucous, tapering to an acuminate point. **Inflorescence** a hemispherical to ovoid head, or a cylindric spiciform panicle, embraced below by 1 or 2 inflated bract-like leaf sheaths bearing a reduced lamina, or sometimes exserted. **Spikelets** 1-flowered, strongly laterally compressed and keeled, disarticulating below the floret, sometimes tardily so or rarely falling entire, awned or awnless. **Glumes** subequal or unequal, 1-nerved, membranous, equal to or shorter than lemma, acute or with an awn-point. **Lemma** 1-nerved, membranous, acute or with an awn-point. **Palea** 1- or 2-nerved. **Caryopsis** elliptic; pericarp free and sometimes swelling when wet.

Species 8, centred on the Mediterranean region and southwest Asia, but extending eastwards to China and southwards to trop. Africa; naturalised in America and with 2 species in sthn trop. Afr.: Malawi, Mozambique.

Ctenium Panz.

(Chloridoideae—Cynodonteae—Chloridinae)

Simon: 25, 75 (1971); Cope: 226 (1999); Longhi-Wagner & Cope: 229 (2003).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cymbopogon Spreng.

(Panicoideae—Andropogoneae—Andropogoninae)

Simon: 17, 50 (1971); Clayton & Renvoize: 759 (1982); Gibbs Russell *et al.*: 94 (1990); Sales: 75 (2002); Phiri (Unpublished).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cynodon Rich.

(Chloridoideae—Cynodonteae—Chloridinae)

Simon: 25, 59 (1971); Gibbs Russell *et al.*: 95 (1990); Cope: 233 (1999); Roodt *et al.*: 117 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Cyrtococcum Stapf

(Panicoideae—Paniceae—Setariinae)

Koechlin: 76 (1962); Clayton & Renvoize: 499 (1982); Clayton & Renvoize: 279 (1986); Van der Zon: 239 (1993); Watson & Dallwitz: 287 (1994).

Annuals or perennials with decumbent or creeping culms rooting at lower nodes. **Leaf blade** narrowly lanceolate; *ligule* membranous. **Inflorescence** a diffuse panicle with capillary branches; pedicels much longer than spikelets, terete, scaberulous. **Spikelets** obliquely obovate in profile, strongly laterally compressed, hispidulous. **Glumes** thinly membranous, half to almost as long as spikelet, *upper glume* obtuse; *lower glume* acute. **Lower floret** sterile, its lemma as long as spikelet, obtuse or rarely mucronate; *upper lemma* as long as spikelet, subcoriaceous to crustaceous, smooth to punctate, gibbous, distinctly crested, margins inrolled and clasping only edges of palea; tip of palea reflexed. **Caryopsis** laterally compressed, asymmetric.

Species 11, Old World tropics, in shady places; sthn trop. Afr. 1: *Cyrtococcum chaetophoron* (Roem. & Schult.) Dandy, Angola.

***Dactylis** L.

(Pooideae—Poeae)

Gibbs Russell *et al.*: 99 (1990); Chapano: 3 (2002).

Sthn trop. Afr. 1: **Dactylis glomerata* L., cultivated and sometimes occurring as an escape, also in sthn Afr.

Dactyloctenium Willd.

(Chloridoideae—Eragrostideae—Eleusininae)

Simon: 26, 60 (1971); Cope: 162 (1999).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Daknopholis Clayton

(Chloridoideae—Cynodonteae—Chloridinae)

Clayton: 102 (1967b); Clayton: 321 (1974); Clayton & Renvoize: 242 (1986); Watson & Dallwitz: 292 (1994).

Prostrate stoloniferous annuals forming loose mats; flowering culms ascending. **Leaf blades** flat; *ligule* a line of hairs. **Inflorescence** of digitate, 1-sided racemes. **Spikelets** 1-flowered with minute rhachilla-extension, strongly laterally compressed, sessile, alternate in 2 rows on a tough axis, disarticulating above glumes. **Glumes** subequal, thinly membranous, shorter than the floret, 1-nerved, upper one broader than lower one; *lemma* membranous, keeled, acute, long-awned. **Caryopsis** narrowly lanceolate, triquetrous.

Monotypic genus: *Daknopholis boivinii* (A.Camus) Clayton, western Indian Ocean region; sthn trop. Afr.: Mozambique.

Danthoniopsis Stapf

(Panicoideae—Arundinelleae)

Clayton & Renvoize: 317 (1986); Clayton: 199 (1989); Gibbs Russell *et al.*: 101 (1990); Watson & Dallwitz: 298 (1994); Izidine & Bandeira: 51 (2002).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Dichanthium Willemet

(Panicoideae—Andropogoneae—Sorghinae)

Stapf: 177 (1917); Clayton & Renvoize: 722 (1982); Setshogo: 131 (2000); Setshogo: 38 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Digitaria Haller

(Panicoideae—Paniceae—Digitariinae)

Clayton & Renvoize: 619 (1982); Goetghebeur & Van der Veken: 133 (1989); Gibbs Russell *et al.*: 106 (1990); Chapano: 13 (2002); Izidine & Bandeira: 51 (2002).

Digitariella De Winter: 467 (1961); Simon: 31, 66 (1971). *Digitariopsis* C.E.Hubb.: Simon: 66 (1971).

Sthn trop. Afr. ± 60, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dignathia Stapf

(Chloridoideae—Cynodonteae—Zoysiinae)

Stapf: t. 2950 (1911b); Clayton: 404 (1974); Clayton & Renvoize: 254 (1986); Watson & Dallwitz: 329 (1994); Cope: 249 (1999).

Wiry, erect annuals. **Leaf blades** lanceolate-linear. **Inflorescence** a cylindric false raceme; racemelets shortly pedunculate, deciduous, comprising 1 or 2 spikelets plus a rudiment separated by the internodes of a short curvaceous rachis. **Spikelets** 1-flowered, narrowly ovate to orbicular, laterally compressed; *glumes* well-developed, longer than the floret, thickly indurated, ± gibbous, scaberulous to lanose, upper one longer than lower one and caudate to a stiff point or awn; *lemma* membranous, keeled, shortly awned. **Caryopsis** ellipsoid, gibbous, laterally compressed.

Species 5, NE trop. Africa, Arabian Peninsula and India; one species, *Dignathia gracilis* Stapf, extending to Mozambique.

Diheteropogon (Hack.) Stapf

(Panicoideae—Andropogoneae—Andropogoninae)

Clayton & Renvoize: 783 (1982); Gibbs Russell *et al.*: 114 (1990); Sales: 91 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Dinebra Jacq.

(Chloridoideae—Eragrostideae—Eleusininae)

Phillips: 411 (1974a); Gibbs Russell *et al.*: 116 (1990); Cope: 45 (1999).

Sthn trop. Afr. 1: *Dinebra retroflexa* (Vahl) Panz. var. *condensata* S.M.Phillips, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Eccoptocarpha Launert

(Panicoideae—Paniceae—Setariinae)

Launert: 126 (1965); Simon: 66 (1971); Clayton & Renvoize: 575 (1982); Clayton & Renvoize: 284 (1986); Clayton: 79 (1989); Watson & Dallwitz: 352 (1994).

Annuals up to ± 0.75 m high. **Leaf blades** linear to lanceolate; *ligule* represented by a line of hairs. **Inflorescence** composed of racemes borne on a common axis; rachis triquetrous, bearing single adaxial spikelets. **Spikelets** obovate-elliptic. **Glumes**: *lower glume* adaxial, $^3/_4$ as long as spikelet; *upper glume* as long as spikelet, with prominent cross-nerves and resembling woven fabric; *lower floret* sterile, its lemma resembling upper glume; *upper floret* crustaceous, shorter than spikelet, stipitate, stipe at first S-shaped, straightening at maturity to extrude floret; *upper palea* obtuse, only its margins clasped by *lemma*, its tip tucked in. **Caryopsis** elliptic, dorsally compressed.

Monotypic genus: *Eccoptocarpha obconiciventris* Launert, Tanzania and Zambia.

Echinochloa P.Beauv.

(Panicoideae—Paniceae—Setariinae)

Stapf: 604 (1920); Wild: 25 (1961); Clayton & Renvoize: 554 (1982); Clayton: 50 (1989); Gibbs Russell *et al.*: 119 (1990).

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr., some species adventive.

Ehrharta Thunb.

(Bambusoideae—Ehrharteae)

Launert: 39 (1971); Simon: 26 (1971); Gibbs Russell & Ellis: 51 (1987); Spies *et al.*: 125 (1989); Gibbs Russell *et al.*: 121 (1990); Chapano: 3 (2002); Spies *et al.*: 123 (2002).

Sthn trop. Afr. 1: *Ehrharta erecta* Lam. var. *abyssinica* (Hochst.) Pilg., Zimbabwe, Malawi, Mozambique, but genus best represented in sthn Afr.

Eleusine Gaertn.

(Chloridoideae—Eragrostideae—Eleusininae)

Phillips: 251 (1972); Phillips: 260 (1974b); Gibbs Russell *et al.*: 129 (1990); Hiremath & Salimath: 161 (1991); Cope: 156 (1999); Chapano: 7 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Elionurus Kunth ex Willd.

(Panicoideae—Andropogoneae—Rottboelliinae)

Stapf: 62 (1917) as *Elyonurus*; Renvoize: 665 (1978); Clayton & Renvoize: 835 (1982); Gibbs Russell *et al.*: 130 (1990); Cope: 156 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Elymandra Stapf

(Panicoideae—Andropogoneae—Anthistiriinae)

Clayton: 287 (1966b); Clayton & Renvoize: 823 (1982); Cope: 138 (2002).

Pleiadelphia Stapf; Koechlin: 191 (1962).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Elytrophorus P.Beauv.

(Arundinoideae—Arundineae)

Clayton: 135 (1970); Gibbs Russell *et al.*: 133 (1990); Cope: 2 (1999).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, and sthn Afr.

Enneapogon Desv. ex P.Beauv.

(Chloridoideae—Pappophoreae)

Renvoize: 393 (1968); Launert: 145 (1971); Simon: 36 (1971); Gibbs Russell *et al.*: 134 (1990).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Enteropogon Nees

(Chloridoideae—Cynodonteae—Chloridinae)

Clayton: 419 (1982); Cope: 216 (1999).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Entolasia Stapf

(Panicoideae—Paniceae—Setariinae)

Simon: 66 (1971); Clayton & Renvoize: 573 (1982); Clayton: 46 (1989).

Sthn trop. Afr. 1: *Entolasia imbricata* Stapf, Angola, Zambia, Malawi, and sthn Afr.

Entoplocamia Stapf

(Chloridoideae—Eragrostideae—Uniolinae)

Gibbs Russell *et al.*: 138 (1990).

Monotypic genus: *Entoplocamia aristulata* (Hack. & Rendle) Stapf; sthn trop. Afr.: Angola, and sthn Afr.

Eragrostis Wolf

(Chloridoideae—Eragrostideae—Eleusininae)

Simon: 26, 60 (1971); Clayton: 188 (1974); Gibbs Russell *et al.*: 139 (1990); Cope: 49 (1999); Bingham & Smith: 143 (2002); Chapano: 5 (2002).

Diandrochloa De Winter; Gibbs Russell *et al.*: 104 (1990). *Stiburus alopecuroides* (Hack.) Stapf; Simon: 28 (1971).

Sthn trop. Afr. ± 115, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Eriochloa Kunth

(Panicoideae—Paniceae—Setariinae)

Stapf: 497 (1919); Clayton & Renvoize: 568 (1982); Clayton: 84 (1989); Gibbs Russell *et al.*: 164 (1990).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Eriochrysis P.Beauv.

(Panicoideae—Andropogoneae—Saccharinae)

Palisot de Beauvois: 8 (1812); Clayton & Renvoize: 706 (1982); Clayton: 4 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Euclasta Franch.

(Panicoideae—Andropogoneae—Sorghinae)

Franchet: 335 (1895); Stapf: 180 (1917); Koechlin: 152 (1962); Clayton & Renvoize: 344 (1986); Watson & Dallwitz: 400 (1994); Setshogo: 131 (2000); Setshogo: 48 (2002).

Annuals; culms geniculately ascending, with stilt-roots, barbate at nodes. **Leaves**: sheath with long, tubercle-based hairs at mouth; lamina linear-lanceolate, drawn out at apex into a setaceous point; midrib whitish, prominent. **Inflorescence** of subdigitate, pedunculate racemes; racemes with 1–3 large homogamous pairs at base; rachis internodes and pedicels with a translucent longitudinal groove. **Sessile spikelet**: *lower glume* chartaceous, ± flat, 5-nerved, pilose on margins and on back below; *upper glume* ovate, strongly carinate, glabrous. **Florets**: *lower* one empty with ovate, carinate lemma ciliate on keel and margins; *upper* one bisexual; lemma entire, hyaline, stipitiform; palea present; *awn* minutely pilose. **Pedicelled spikelet** larger than sessile one, male or neuter.

Species 2, tropical America, India, trop. Africa; sthn trop. Afr. 1: *Euclasta condylotricha* (Hochst. ex Steud.) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Eulalia Kunth

(Panicoideae—Andropogoneae—Saccharinae)

Stapf: 97 (1917); Clayton & Renvoize: 711 (1982); Clayton & Renvoize: 711 (1986); Watson & Dallwitz: 401 (1994); Clayton: 12 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Eustachys Desv.

(Chloridoideae—Cynodonteae—Chloridinae)

Renvoize: 335 (1974); Gibbs Russell *et al.*: 167 (1990); Nowack: 53 (1995); Cope: 214 (1999).

Sthn trop. Afr. 1, *Eustachys paspaloides* (Vahl) Lanza & Mattei, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Exotheca Andersson

(Panicoideae—Andropogoneae—Anthistiriinae)

Andersson: 253 (1856); Clayton: 447 (1967a); Simon: 50 (1971); Clayton & Renvoize: 821 (1982); Clayton & Renvoize: 356 (1986); Watson & Dallwitz: 406 (1994); Cope: 134 (2002).

Densely caespitose perennials. **Leaves** linear; sheath produced at mouth into narrow auricles; *ligule* scarious, adnate to sheath-auricles. **Inflorescence** composed of paired racemes, pairs each subtended by a spatheole and gathered into a scanty false panicle; racemes short, upper raceme borne on a very long raceme-base, its basal spikelets at ± same level as apex of lower raceme, the two thus appearing to be arranged end-to-end, each raceme with 2 homogamous spikelet pairs; pedicels linear. **Sessile spikelet** terete; *callus* pungent, applied obliquely. **Glumes**: *lower glume* subcoriaceous with a herbaceous beak 2–3 mm long, rounded on back and sides; *upper glume* awnless. **Lower floret** reduced to a hyaline lemma; *upper lemma* hyaline, bidentate, passing between teeth into an awn with pubescent column. **Caryopsis** narrowly oblong. **Pedicelled spikelet** male, without distinct callus.

Monotypic genus: *Exotheca abyssinica* (Hochst. ex A.Rich.) Andersson, Vietnam, and trop. Africa; sthn trop. Afr.: Zambia, Malawi, Mozambique.

Festuca L.

(Pooideae—Poeae)

Clayton: 56 (1970); Launert: 54 (1971); Simon: 36, 71 (1971); Clayton & Renvoize: 93 (1986); Gibbs Russell: 168 (1990); Chapano: 3 (2002).

Pseudobromus K.Schum.: 108 (1895);Launert: 51 (1971); Watson & Dallwitz: 782 (1994).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Fingerhuthia Nees

(Chloridoideae—Eragrostideae—Uniolinae)

Simon: 36 (1971); Cope: 17 (1999).

Sthn trop. Afr. 1: *Fingerhuthia africana* Nees, Angola, Zimbabwe, Mozambique, and sthn Afr.

Gilgiochloa Pilg.

(Panicoideae—Arundinelleae)

Pilger: 415 (1914); Simon: 56 (1971); Hubbard: 413 (1974); Clayton & Renvoize: 317 (1986); Clayton: 204 (1989); Watson & Dallwitz: 423 (1994).

Annuals up to 0.9 m high; culms erect to ascending, pubescent at nodes. **Leaf blades** flat, crinkled on one margin; *ligule* a ciliate fringe. **Inflorescence** a cylindric spiciform panicle; pedicels ± accrescent to axis. **Spikelets** narrowly lanceolate, purplish, disarticulating beneath each floret; *lower floret* sterile; *lower glume* with an *awn* 4–7 mm long; *upper glume* acuminate; *lower lemma* 5–7-nerved, its *palea* becoming thickened and hardened like a chip of wood; *upper lemma* with hair tufts on margin and at base of awn, bilobed, with a deciduous geniculate *awn*; *callus* oblong, truncate; *palea* keels terminating in a small swelling. **Stamens** 3. **Caryopsis** lanceolate, glabrous; hilum linear.

Monotypic genus: *Gilgiochloa indurata* Pilg., central Africa; sthn trop. Afr.: Zambia, Malawi, Mozambique.

Guaduella Franch.

(Bambusoideae—Bambuseae—Arundinariinae)

Franchet: 676 (1887); Pilger: 123 (1901); Clayton: 247 (1962); Koechlin: 200 (1962); Cope: 660 (1983b); Clayton & Renvoize: 46 (1986); Watson & Dallwitz: 432 (1994); Sosef: 28 (1999); Clark *et al.*: 181 (2000).

Herbaceous perennials with creeping rhizomes and with culms either bearing leaves and inflorescences on same culm, or culms either sterile and bearing leaves mainly in upper part, or fertile and leafless except for leaf sheaths near base. **Leaves**: sheaths strongly striate; blades ovate-lanceolate to oblong-elliptic, narrowing abruptly near base into a pseudopetiole. **Inflorescence** terminal, racemose or paniculate. **Spikelets** linear, bearing up to 25 florets, the lower 1–3 male, the others bisexual. **Glumes** 2, ovate to broadly so, usually pubescent; lower one usually shorter than upper. **Palea** membranous, oblong, bicarinate, obtuse. **Lodicules** 3, hyaline, oblong-cuneate, truncate. **Stamens** 6, with free filaments. **Ovary** oblong, pubescent; styles 2, free, with papillose stigmas.

Species 6, trop. Africa; sthn trop. Afr. 2, Angola (Cabinda).

Habrochloa C.E.Hubb.

(Chloridoideae—Eragrostideae—Eleusininae)

Hubbard: t. 3645 (1967); Clayton & Renvoize: 205 (1986); Watson & Dallwitz: 437 (1994); Cope: 23 (1999).

Delicate, very slender, erect or ascending annuals. **Leaf blade** flat, flaccid, glabrous or loosely pilose. **Inflorescence** a delicate panicle. **Spikelets** 3–5-flowered, laterally compressed; *florets* loosely exserted from glumes, disarticulating above glumes and between florets; *glumes* membranous, narrowly lanceolate, slightly unequal, 1-nerved, keeled, acuminate; *lemmas* keeled, thinly membranous, 3-nerved, ciliate on margins, shortly and bluntly 2-lobed at apex, with a filiform, slightly recurved *awn* from the sinus. **Caryopsis** linear.

Monotypic: *Habrochloa bullockii* C.E.Hubb., trop. Africa; sthn trop. Afr.: Zambia, Zimbabwe, Malawi.

Hackelochloa Kuntze

(Panicoideae—Andropogoneae—Rottboelliinae)

Clayton & Renvoize: 847 (1982); Clayton & Renvoize: 847 (1986); Watson & Dallwitz: 438 (1994); Cope: 178 (2002).

Manisuris L.f.; Stapf: 57 (1917).

Sthn trop. Afr. 1: *Hackelochloa granularis* (L.) Kuntze, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Halopyrum Stapf

(Chloridoideae—Eragrostideae—Eleusininae)

Stapf: t. 2448 (1896); Clayton & Renvoize: 212 (1986); Watson & Dallwitz: 442 (1994); Cope: 36 (1999).

Tough, stoloniferous perennials; stolons rooting to form dense tussocks; culms rigid, woody, branching to form fascicles at nodes. **Leaf blades** narrowly linear to setaceous, flat or involute, stiff, glaucous. **Inflorescence** of short racemes scattered along and appressed to an elongated central axis. **Spikelets** several-flowered, shortly pedicelled, laterally compressed, disarticulating above glumes and between florets; *callus* conspicuously barbate with hairs ± half as long as lemma; *glumes* persistent, subequal, lower one 3–5-nerved, upper one 5–7-nerved; *lemmas* exserted from glumes, 3-nerved, coriaceous, dorsally rounded or keeled only above middle, acute or subobtuse at apex, entire or bidenticulate, shortly mucronate. **Caryopsis** elliptic to elliptic-oblong, concavo-convex in section.

Monotypic: *Halopyrum mucronatum* (L.) Stapf, shores of Indian Ocean and Red Sea; sthn trop. Afr.: Mozambique.

Harpachne Hochst. ex A.Rich.

(Chloridoideae—Eragrostideae—Eleusininae)

Richard: 431 (1851); Clayton & Renvoize: 220 (1986); Watson & Dallwitz: 443 (1994); Cope: 152 (1999).

Densely caespitose perennials; culms wiry, erect or ascending from a procumbent base, simple or branched at lower nodes. **Leaf blades** flat or convolute, tapering to a fine point. **Inflorescence** a single 'bottle-brush' raceme with reflexed spikelets hanging on slender pedicels. **Spikelets** several- to many-flowered; *lower florets* usually shorter than upper ones, strongly laterally compressed, falling entire; pedicel fracturing near its attachment to rachis and remaining attached to base of spikelet as a pungent, often hooked appendage; *glumes* 1-nerved, unequal, narrow, keeled, shorter than lemmas; *lemmas* 3-nerved, lateral nerves ± $^3/_4$ as long as lemma, lanceolate to linear-lanceolate, thinly membranous to somewhat cartilaginous, scabrid on keel, minutely ciliate on margins, acuminate to narrowly acuminate-aristate; *palea* gibbous, keels winged. **Caryopsis** laterally compressed, obliquely elliptic in profile.

Species 2, E and NE Africa and Arabian Peninsula; sthn trop. Afr. 1: *Harpachne schimperi* Hochst. ex A.Rich., Zambia, Zimbabwe.

Harpochloa Kunth

(Chloridoideae—Cynodonteae—Chloridinae)

Clayton: 419 (1982); Cope: 223 (1999).

Rendlia Chiov. in part; Simon: 59 (1971).

Sthn trop. Afr. 1: *Harpochloa pseudoharpechloa* (Chiov.) Clayton, Angola, Zambia; and sthn Afr.

Helictotrichon Besser

(Pooideae—Aveneae—Aveninae)

Clayton: 86 (1970); Launert: 76 (1971); Simon: 23, 58 (1971).

Sthn trop. Afr. 2, Zambia, Zimbabwe, Malawi, and sthn Afr.

Hemarthria R.Br.

(Panicoideae—Andropogoneae—Rottboelliinae)

Clayton & Renvoize: 851 (1982); Van den Heuvel & Veldkamp: 443 (2000); Cope: 164 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Heteranthoecia Stapf

(Panicoideae—Isachneae)

Stapf: t. 2927 (1911b); Simon: 63 (1971); Hubbard: 432 (1974); Clayton & Renvoize: 310 (1986); Clayton: 189 (1989); Watson & Dallwitz: 454 (1994).

Trailing, mat-forming annuals in swamps or shallow water; culms up to 0.3 m high, base decumbent and rooting at nodes. **Leaves** up to ± 30 mm long, narrowly lanceolate. **Inflorescence** of short unilateral racemes along a central axis, raceme rachis spreading or eventually reflexed, terminating in a point.

Florets dissimilar, both fertile. **Spikelets** gaping; *glumes* persistent, subequal, $^1/_2$–$^2/_3$ as long as spikelet; *lower lemma* firmly membranous, acuminate; *upper lemma* crisply chartaceous, $^1/_2$ as long as lower one, obtuse to subacute, densely and minutely pubescent. **Stamens** 3. **Caryopsis** subglobose, slightly dorsally flattened.

Monotypic genus: *Heteranthoecia guineensis* (Franch.) Robyns, trop. Africa; sthn trop. Afr. Angola, Zambia.

Heteropholis C.E.Hubb.

(Panicoideae—Andropogoneae—Rottboelliinae)

Hubbard: t. 3548 (1956); Clayton & Renvoize: 849 (1982); Clayton & Renvoize: 366 (1986); Watson & Dallwitz: 455 (1994); Cope: 176 (2002).

Perennials arising from a short scaly rhizome. **Leaf blade** flat, gradually tapering to a flexuouse apex; *ligule* shortly membranous. **Inflorescence** a single axillary raceme; racemes cylindric or slightly dorsally compressed; internodes thickened, clavate, fixed to adjacent pedicel. **Sessile spikelet** ± embedded in internode; *callus* truncate, with prominent central boss or peg; *lower glume* crustaceous, broadly convex, 2-keeled or sharply involute along sides, back smooth, cancellate or areolate, winged at apex. **Lower floret** reduced to a hyaline lemma or sometimes with a palea; *upper lemma* entire and awnless. **Caryopsis** ellipsoid, dorsally flattened. **Pedicelled spikelet** thinly coriaceous, ± as big as sessile one or smaller; pedicel oblong, flattened.

Species 4, Indo-China, Philippines, and trop. Africa; sthn trop. Afr. 1: *Heteropholis sulcata* (Stapf) C.E.Hubb., Angola, Zambia, Malawi.

Heteropogon Pers.

(Panicoideae—Andropogoneae—Anthistiriinae)

Stapf: 410 (1919); Clayton & Renvoize: 825 (1982); Gibbs Russell *et al.*: 178 (1990); Cope: 145 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Holcus** L.

(Pooideae—Aveneae—Aveninae)

Gibbs Russell *et al.*: 180 (1990); Chapano: 3 (2002).

Sthn trop. Afr. 1: **Holcus lanatus* L., occasionally cultivated and naturalised, also in sthn Afr.

Homozeugos Stapf

(Panicoideae—Andropogoneae—Saccharinae)

Stapf: t. 3033 (1915); Clayton: 11 (1973a); Clayton & Renvoize: 711 (1982); Clayton & Renvoize: 333 (1986); Watson & Dallwitz: 468 (1994); Clayton: 15 (2002); Guala: 196 (2002).

Caespitose perennials; culms 1–2 m high. **Leaves**: sheaths with auricles 4–25 mm long. **Inflorescence** of 1–several digitate racemes; racemes fragile, white-villous, with linear internodes. **Spikelets** alike, one sessile, one pedicelled; *callus* acutely conical to pungent and obliquely attached to internode; *lower glume* coriaceous, convex, obtuse at apex. **Lower floret** reduced to a hyaline lemma. **Upper lemma** linear, bidentate, with a pilose *awn*.

Species 6, central Africa; sthn trop. Afr. 6, Angola, Zambia, Malawi.

Hubbardochloa Auquier

(Chloridoideae—Eragrostideae—Sporobolinae)

Auquier: 241 (1980); Clayton & Renvoize: 227 (1986); Watson & Dallwitz: 474 (1994); Cope: 200 (1999).

Annuals, purplish, loosely caespitose; culms erect or geniculately ascending, very slender, usually branched from lower nodes. **Leaf blade** linear-lanceolate, flat, abruptly contracted at base, apex acute. **Inflorescence** a delicate open panicle, lower branches subverticillate. **Spikelets** 1-flowered, fusiform, disarticulating below floret; *glumes* 1-nerved, thinly membranous, longer than floret, persistent; *lemma* 1-nerved, hyaline, thinner than glumes, entire at apex and with a long flexuous terminal *awn*; *palea* absent. **Caryopsis** fusiform; pericarp free.

Monotypic genus: *Hubbardochloa gracilis* Auquier, central Africa; sthn trop. Afr., Zambia.

Hydrothauma C.E.Hubb.

(Panicoideae—Paniceae—Setariinae)

Hubbard: t. 3458 (1947); Simon: 67 (1971); Clayton & Renvoize: 277 (1986); Clayton: 46 (1989); Watson & Dallwitz: 478 (1994).

Aquatic annuals; culms branched from base and geniculate or prostrate-ascendent with culms and false petioles containing air canals. **Leaves**: lamina floating; lower leaves on long false petioles; upper surface raised into sinuous longitudinal lamellae; *ligule* membranous. **Inflorescence** a slender spiciform panicle, sometimes reduced to a unilateral raceme with paired spikelets. **Spikelets** dorsally compressed; lower glume half as long as spikelet, hyaline, truncate; upper glume equalling spikelet and gibbous; upper lemma cartilaginous with flat margins. **Lodicules** 2, minute. **Stamens** 3; anthers oblong. **Ovary** glabrous; style free, terminal.

Monotypic genus: *Hydrothauma manicatum* C.E.Hubb., from Zaire and Zambia. Related to *Sacciolepis*.

Hylebates Chippind.

(Panicoideae—Paniceae—Digitariinae)

Chippindall: 127 (1945); Clayton & Renvoize: 658 (1982); Clayton & Renvoize: 296 (1986); Clayton: 128 (1989); Watson & Dallwitz: 481 (1994).

Straggling annuals, rooting at lower nodes; culms up to 1.5 m high. **Leaves**: lamina broadly linear to narrowly lanceolate, cordate and amplexicaul at base; *ligule* a very short hairy membrane. **Inflorescence** a panicle with some or all branches whorled. **Spikelets** elliptic, dorsally compressed; *lower glume* ovate, up to $^1/_3$ as long as spikelet and clasping its base; *upper glume* ± as long as spikelet; *lower floret* sterile, represented by a membranous *lemma* as long as spikelet and abruptly terminating in a short *awn*; *upper lemma* thinly chartaceous, acute, dull, its flat, thin margins enfolding and concealing the *palea*. **Caryopsis** subglobose.

Species 2, eastern trop. Africa; sthn trop. Afr. 1: *Hylebates cordatus* Chippind., Zambia, Zimbabwe, Mozambique. Easily mistaken for *Panicum*, but the superior floret indicates its affinity to *Digitaria*.

Hyparrhenia E.Fourn.

(Panicoideae—Andropogoneae—Anthistiriinae)

Clayton & Renvoize: 788 (1982); Gibbs Russell *et al.*: 182 (1990); Chapano:

16 (2002); Cope: 95 (2002).

Sthn trop. Afr. ± 33, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Hyperthelia Clayton

(Panicoideae—Andropogoneae—Anthistiriinae)

Clayton: 438 (1967); Simon: 18, 51 (1971); Clayton & Renvoize: 786 (1982); Cope: 136 (2002).

Sthn trop. Afr. 1: *Hyperthelia dissoluta* (Nees ex Steud.) Clayton, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Imperata Cirillo

(Panicoideae—Andropogoneae—Saccharinae)

Clayton & Renvoize: 700 (1982); Clayton: 10 (2002).

Sthn trop. Afr. 1: *Imperata cylindrica* (L.) Raeusch., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Isachne R.Br.

Brown: 196 (1810); Clayton & Renvoize: 309 (1986); Clayton: 193 (1989); Watson & Dallwitz: 495 (1994).

Rambling perennials; culms up to 0.6 m high, geniculately ascending from a prostrate base rooting at nodes. **Leaves** linear to lanceolate; ligule a line of hairs. **Inflorescence** a panicle. **Spikelets** 2-flowered. **Florets** similar or dissimilar, separated by an abbreviated internode, lower floret sometimes male; rachilla disarticulating below each floret. **Glumes** subequal, $^3/_4$ to as long as spikelet, 5–9-nerved, membranous, falling soon after florets. **Lemmas** elliptic-oblong to orbicular, obscurely 5–7-nerved, obtuse; lower one membranous to coriaceous; upper one crisply chartaceous to crustaceous. **Stamens** 3. **Caryopsis** ellipsoid to suborbicular, dorsally flattened on one side.

Species ± 100, throughout the tropics, but mainly Asia; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Ischaemum L.

(Panicoideae—Andropogoneae—Ischaeminae)

Stapf: 28 (1917); Wild: 23 (1961); Clayton & Renvoize: 746 (1982); Cope: 50 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Kampochloa Clayton

(Chloridoideae—Cynodonteae—Chloridinae)

Clayton 103 (1967b); Simon: 79 (1971); Clayton & Renvoize: 241 (1986); Watson & Dallwitz: 508 (1994); Cope: 223 (1999).

Densely caespitose perennials. **Leaf blade** usually involute, sometimes flat. **Inflorescence** a solitary raceme bearing pectinate spikelets on a puberulous rachis. **Spikelets** 2-flowered, laterally compressed, sessile, alternate in 2 rows on a tough axis, tardily disarticulating above glumes but not between florets. **Glumes** dissimilar, subequal in length, inferior one 1-nerved, minutely 2-toothed at apex with an awnlet in the sinus; upper one nerveless, with an oblique dorsal *awn*. **Lower floret** fertile; *fertile lemma* hyaline, pilose on keel and ciliate on lateral nerves, 2-toothed at apex and mucronulate. **Upper floret** male, its *lemma* glabrous, awned from the back; rachilla terminated by a cluster of sterile awns usually accompanied by a very reduced lemma.

Monotypic genus: *Kampochloa brachyphylla* Clayton, only known from Angola and Zambia.

?Kaokochloa De Winter

(Chloridoideae—Pappophoreae)

De Winter: 479 (1961); Clayton & Renvoize: 190 (1986); Gibbs Russell *et al.*: 191 (1990).

Monotypic genus: *Kaokochloa nigrirostris* De Winter, ?Angola, and sthn Afr.; no confirmed record from Angola seen.

Koeleria Pers.

(Pooideae—Aveneae—Aveninae)

Clayton: 79 (1970); Launert: 69 (1971); Chapano: 3 (2002).

Aira L. in part; Chapano: 3 (2002) as synonym.

Sthn trop. Afr. 1: *Koeleria capensis* (Steud.) Nees, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Leersia Sw.

(Bambusoideae—Oryzeae)

Clayton: 70 (1970); Launert: 26 (1971); Simon: 29, 63 (1971); Terrell *et al.*: 423 (1983); Clayton & Renvoize: 73 (1986); Gibbs Russell *et al.*: 196 (1990); Van der Zon: 44 (1993).

Sthn trop. Afr. 6, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Leptaspis R.Br.

(Bambusoideae—Phareae)

Brown: 211 (1810); Launert: 21 (1971); Simon: 36 (1971); Clayton & Renvoize: 68 (1986); Watson & Dallwitz: 529 (1994).

Perennial rhizomatous bamboo-like grasses. **Leaf blade** large, asymmetric, with a typical slanting venation, tessellate, borne on a twisted (180°) pseudopetiole; ligule scarious, often fringed. **Inflorescence** a loose panicle, usually terminal, containing male and female spikelets, with females in a group at base and male or males terminal on branchlets. **Spikelets** 1-flowered, monoecious, heteromorphous, unisexual; male spikelets usually much smaller and less conspicuous than female ones; *glumes* 2, much smaller than spikelet, subequal, membranous, ovate, 5–7-nerved, usually spreading; *lemma* similar to glumes but with more nerves, cymbiform; palea shorter than lemma, membranous, distinctly 2-keeled, 2-nerved, narrowly oblong, with apex bidentate. **Stamens** 6; filaments rather short; anthers linear. **Bisexual spikelets** subsessile, rather conspicuous, ovoid or conchiform, inflated; *glumes* 2, subequal, much shorter than spikelet; lemma with margins connate (thus utricle-like) with an apical or lateral porus, inflated, prominently nerved and usually longitudinally ribbed, ± densely covered with stiff, short, hooked hairs; *palea* completely enclosed by lemma, longer than utricle and often appearing at porus, very delicate, linear, 2-keeled, with apex bidentate. **Lodicules** very small to nil. **Ovary** small, narrowly ovoid, gibbous; style

simple; stigmas 3, rather long, filiform, plumose, exserted through porus of lemma. **Caryopsis** free from lemma, oblong in outline, compressed; hilum linear, within a longitudinal groove; embryo very small.

Species 5–7, palaeotropical, represented by only *Leptaspis cochleata* Thwaites in trop. Africa and Madagascar; sthn trop. Afr.: Zimbabwe, Mozambique.

Leptocarydion Stapf

(Chloridoideae—Eragrostideae—Eleusininae)

Phillips: 294 (1974b); Gibbs Russell *et al.*: 197 (1990); Cope: 41 (1999).

Sthn trop. Afr. 1: *Leptocarydion vulpiastrum* (De Not.) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique, sthn Afr.

Leptochloa P.Beauv.

(Chloridoideae—Eragrostideae—Eleusininae)

Phillips: 276 (1974b); Cope: 23 (1999).

Diplachne P.Beauv.; Simon: 26, 60 (1971); Gibbs Russell *et al.*: 116 (1990).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lepturus R.Br.

(Chloridoideae—Leptureae)

Gibbs Russell *et al.*: 199 (1990); Cope: 202 (1999).

Monerma P.Beauv.; Chapano: 8 (2002) as synonym. *Ophiuros* C.F.Gaertn. in part; Chapano: 8 (2002) as synonym.

Sthn trop. Afr. 2, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Lintonia Stapf

(Chloridoideae—Cynodonteae—Pommereullinae)

Simon: 36 (1971); Phillips: 302 (1974b); Cope: 205 (1999).

Negria Chiov.; Chapano: 8 (2002) as synonym.

Sthn trop. Afr. 1: *Lintonia nutans* Stapf, Zimbabwe, Mozambique, and sthn Afr.

*Lolium L.

(Pooideae—Poeae)

Launert: 42 (1971); Simon: 37 (1971); Clayton & Renvoize: 95 (1986); Gibbs Russell *et al.*: 201 (1990).

Species 8, Eurasian, introduced into most temperate and subtropical regions of the world, including Zimbabwe, and sthn Afr.

Lophacme Stapf

(Chloridoideae—Eragrostideae—Eleusininae)

Clayton & Renvoize: 213 (1986); Gibbs Russell *et al.*: 203 (1990) as *Lophachme*; Cope: 39 (1999).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, and sthn Afr.

Loudetia Hochst. ex Steud.

(Panicoideae—Arundinelleae)

Conert: 247 (1957); Clayton: 415 (1974); Clayton: 216 (1989); Gibbs Russell *et al.*: 205 (1990).

Sthn trop. Afr. 8, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Loudetiopsis Conert

(Panicoideae—Arundinelleae)

Conert: 277 (1957); Clayton: 122 (1967c); Clayton: 414 (1972); Clayton & Renvoize: 319 (1986); Watson & Dallwitz: 568 (1994).

Erect perennials, rarely annual; culms slender, usually unbranched. **Leaf blade** linear to linear-lanceolate, acuminate; *ligule* a dense row of hairs. **Inflorescence** an open to contracted panicle. **Spikelets** linear-lanceolate, brown, borne in dense triads with short pedicels; peduncle often developing a fragile hook. **Lemmas**: lower one 3(5–7)-nerved; upper one glabrescent to pubescent, bidentate; *callus* square to oblong, truncate to 2-toothed. **Palea** keels thickened or not, wingless. **Lodicules** 2, glabrous, cuneate. **Stamens** 2(3); anthers linear. **Ovary** glabrous; styles terminal. **Caryopsis** elongate; hilum linear.

Species 11, South America and W trop. Africa; sthn trop. Afr. 1: *Loudetiopsis ambiens* (K.Schum.) Conert, Angola.

Loxodera Launert

(Panicoideae—Andropogoneae—Rottboelliinae)

Launert: 80 (1963); Simon: 19, 52 (1971); Clayton: 580 (1977); Clayton & Renvoize: 838 (1982); Clayton & Renvoize: 362 (1986); Watson & Dallwitz: 571 (1994); Cope: 154 (2002).

Lepargochloa Launert: 82 (1963).

Tufted perennials. **Leaf blade** flat or folded; *ligule* membranous. **Inflorescence** a single, stout, ± flattened, tardily disarticulating raceme; internodes narrowly oblong to clavate, the summit crateriform with a lobed scarious rim. **Sessile spikelet** narrowly ovate to narrowly oblong; *callus* oblique, broadly obtuse, conspicuously barbate, inserted into summit of internode, hairs exserted to form a ring around each node; *lower glume* coriaceous, broadly convex, margins sharply inflexed and becoming keeled towards apex, usually with nerves raised into longitudinal ridges running whole length of glume, sometimes muricate on sides, entire at apex; *upper glume* awnless; *lower floret* male, with palea; *upper lemma* entire and awnless. **Caryopsis** ellipsoid. **Pedicelled spikelet** ± as long as sessile one, or much reduced, awnless or rarely awned from lower glume; pedicel free, resembling internode.

Species 5, trop. Africa; sthn trop. Afr. 3, Angola, Zambia, Zimbabwe.

Megaloprotachne C.E.Hubb.

(Panicoideae—Paniceae—Digitariinae)

Clayton: 130 (1989); Gibbs Russell *et al.*: 207 (1990).

Monotypic genus: *Megaloprotachne albescens* C.E.Hubb.; sthn trop. Afr. Angola, Zambia, Zimbabwe, and sthn Afr.; *M. glabrescens* Roiv., a less hairy variant, is not regarded as a separate species.

Megastachya P.Beauv.

(Centothecoideae—Centotheceae)

Clayton: 161 (1970); Launert: 139 (1971); Clayton & Renvoize: 160 (1986).

Monotypic genus: *Megastachya mucronata* (Poir.) P.Beauv., trop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Melinis P.Beauv.

(Panicoideae—Paniceae—Melinidinae)

Clayton & Renvoize: 505 (1982); Clayton & Renvoize: 295 (1986); Zizka: 115 (1989); Gibbs Russell *et al.*: 210 (1990); Zizka: 3 (1991); Chapano: 12 (2002).

Rhynchelytrum Nees; Stapf & Hubbard: 869 (1930); Koechlin: 102 (1962); Simon: 34 (1971); Clayton & Renvoize: 510 (1982); Clayton & Renvoize: 295 (1986).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Merxmuellera Conert

(Arundinoideae—Arundineae)

Gibbs Russell *et al.*: 213 (1990).

Danthonia DC.; Simon: 25 (1971). *Rytidosperma* Steud. in part; Cope: 7 (1999).

Sthn trop. Afr. 2, Zimbabwe, Malawi, Mozambique, but mainly sthn Afr.

Microchloa R.Br.

(Chloridoideae—Cynodonteae—Chloridinae)

Simon: 25, 67 (1971); Clayton & Renvoize: 242 (1986); Cope: 229 (1999).

Rendlia Chiov.; Simon: 25, 59 (1971); Kupicha & Cope: 90 (1985); Gibbs Russell *et al.*: 218 (1990).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Microstegium Nees

(Panicoideae—Andropogoneae—Saccharinae)

Clayton & Renvoize: 715 (1982); Clayton & Renvoize: 335 (1986); Clayton: 17 (2002).

Sthn trop. Afr. 1: *Microstegium nudum* (Trin.) A.Camus, Zimbabwe, Mozambique, and sthn Afr.; possibly introduced from Asia.

Miscanthus Andersson

(Panicoideae—Andropogoneae—Saccharinae)

Clayton & Renvoize: 702 (1982); Clayton & Renvoize: 332 (1986); Clayton: 8 (2002).

Miscanthidium Stapf; Bennett: 188 (1980).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, and sthn Afr.

Monelytrum Hack. ex Schinz

(Chloridoideae—Cynodonteae—Zoysiinae)

Schweickerdt: 71 (1946); Launert: 131 (1970); Clayton & Renvoize: 253 (1986); Gibbs Russell *et al.*: 222 (1990); Watson & Dallwitz: 618 (1994); Fish: 705 (2000).

Monotypic genus: *Monelytrum luederitzianum* Hack., S Angola, and sthn Afr. (Namibia).

Monocymbium Stapf

(Panicoideae—Andropogoneae—Anthistiriinae)

Stapf: 386 (1919); Clayton & Renvoize: 358 (1986); Cope: 143 (2002).

Sthn trop. Afr. 1: *Monocymbium ceresiiforme* (Nees) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Nematopoa C.E.Hubb.

(Arundinoideae—Arundineae)

Hubbard: 51 (1957a); Clayton & Renvoize: 179 (1986); Watson & Dallwitz: 639 (1994); Cope: 12 (1999).

Loosely caespitose perennials arising from a slender rhizome and forming tufts; culms erect, slender. **Leaf blade** filiform, flexuose, firm but not pungent, glabrous. **Inflorescence** an open panicle with capillary branches. **Spikelets** 4–7-flowered; *glumes* very unequal, shorter than lowermost lemma; *callus* of floret short, oblong; *lemmas* dorsally rounded, 3-nerved, pilose on back and margins, shortly and setaceously 2-lobed at apex, with a long slender flexuous *awn* in sinus; *palea* ± 4/5 as long as *lemma*, keels glabrous, wingless.

Monotypic genus: *Nematopoa longipes* (Stapf & C.E.Hubb.) C.E.Hubb., known only from Zambia and Zimbabwe.

Neyraudia Hook.f.

(Chloridoideae—Eragrostideae—Eleusininae)

Hooker: 305 (1896); Clayton & Renvoize: 204 (1986); Watson & Dallwitz: 486 (1994); Cope: 20 (1999).

Tall, reed-like perennials with short, scaly rhizome; culms up to 4 m high and up to 10 mm in diameter, somewhat woody. **Leaf blade** mostly involute, filiform at apex. **Inflorescence** a large plumose panicle. **Spikelets** 2–7-flowered; florets well exserted from glumes, disarticulating above glumes and between florets, all *florets* bisexual or lowermost sterile and lacking a palea; *glumes* membranous, lanceolate, unequal, 1–3-nerved, acuminate or drawn out into a short awn-point; *lemmas* keeled, scarious-membranous, 3-nerved, long-ciliate on lateral nerves, usually shortly 2-toothed at apex and with a recurved *awn* from sinus. **Caryopsis** linear, subterete.

Species 2, Old World tropics; sthn trop. Afr. 1: *Neyraudia arundinacea* (L.) Henr., Malawi.

Odyssea Stapf

(Chloridoideae—Eragrostideae—Eleusininae)

Clayton & Renvoize: 212 (1986); Cope: 34 (1999).

Diplachne sensu Rendle: 227 (1899).

Sthn trop. Afr. 1: *Odyssea paucinervis* (Nees) Stapf, Angola, Zambia, Zimbabwe, and sthn Afr.

***Olyra** L.

(Bambusoideae—Olyreae)

Launert: 23 (1971); Clayton & Renvoize: 62 (1986); Soderstrom & Zuloaga (1989).

Sthn trop. Afr. 1: **Olyra latifolia* L., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr. Soderstrom & Zuloaga: 29 (1989) state that the species is found essentially throughout the Neotropics and has become naturalised in Africa, including Madagascar.

Oplismenus P.Beauv.

(Panicoideae—Paniceae—Setariinae)

Rendle: 184 (1899); Koechlin: 56 (1962); Clayton & Renvoize: 541 (1982);

Clayton: 6 (1989).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Oreobambos K.Schum.

(Bambusoideae—Bambuseae—Bambusinae)

Schumann: 178 (1896); Burtt Davy *et al.*: 55 (1958); Launert: 19 (1971); Clayton & Renvoize: 54 (1986); Watson & Dallwitz: 665 (1994); White *et al.*: 102 (2001); Bingham & Smith: 143 (2002); Coates Palgrave: 95 (2002); Mapaura & Timberlake: 168 (2002).

Tall woody bamboos. **Leaf blade** lanceolate to oblong-lanceolate, usually glabrous, finally disarticulating from sheath. **Inflorescence** narrow, slender, large, composed of clusters of spikelets on opposite sides of its branches; each cluster borne in axil of a deciduous sheath which is usually without a lamina. **Spikelets** sessile, 2-flowered, terete or somewhat laterally compressed, muticous subtended by a pseudo-involucre of broad coriaceous bracts; florets both bisexual; rachilla disarticulating beneath upper glume, produced as a fine bristle beyond upper floret; *lower glume* absent; *upper glume* 11–18-nerved, dorsally rounded, chartaceous to coriaceous, with margins involute; *lemmas* exceeding glumes, many-nerved (11–23), with transverse veinlets, imbricate, dorsally rounded, chartaceous to chartaceous-coriaceous; paleas slightly shorter than corresponding lemmas, 5–11-nerved, 2-keeled, flat between keels. **Lodicules** absent. **Stamens** 6; filaments free, anthers distinctly mucronate. **Ovary** pilose at apex; stigma 1. **Caryopsis** crustaceous, with a free pericarp, with a pilose apical appendage.

Monospecific: *Oreobambos buchwaldii* K.Schum., Zambia, Malawi, confined to the eastern African mountains.

Oropetium Trin.

(Chloridoideae—Eragrostideae—Eleusininae)

Simon: 25 (1971); Clayton & Renvoize: 211 (1986); Gibbs Russell *et al.*: 228 (1990); Cope: 32 (1999).

Sthn trop. Afr. 1: *Oropetium capense* Stapf, Angola, Zimbabwe, Mozambique, and sthn Afr.

Orthoclada P.Beauv.

(Centothecoideae—Centotheceae)

Palisot de Beauvois: 69 (1812); Launert: 139 (1971); Clayton & Renvoize: 161 (1986); Watson & Dallwitz: 671 (1994).

Robust perennial grasses with erect or ascending culms and a stout, horizontally creeping rhizome; *ligule* membranous, truncate, short. **Leaf blade** with a short pseudopetiole; venation tessellate. **Inflorescences** loose open panicles. **Spikelets** pedicelled, laterally compressed, imbricate, awnless, 1–5-flowered, with all florets both fertile and bisexual except uppermost one which is reduced; rachilla glabrous or somewhat pubescent, not disarticulating between florets; internodes adnate to base of palea; *glumes* equal in size or lower one slightly shorter, keeled, 3–5-nerved, membranous to chartaceous, acute; lower one narrowly to broadly lanceolate; upper one broadly lanceolate to lanceolate-oblong; *lemmas* 5–7-nerved, somewhat keeled or dorsally rounded, membranous to cartilaginous, elliptic or ovate-elliptic if expanded, acute or subobtuse, sometimes mucronulate; lateral nerves usually faint; *paleas* slightly shorter than corresponding lemmas, 2–4-nerved, 2-keeled, laterally compressed, keels close together, scaberulous along keels. **Lodicules** 2, minute, cuneate, apex truncate, glabrous. **Stamens** 2 or 3; anthers narrowly oblong. **Ovary** glabrous; styles distinct; stigmas plumose, laterally exserted. **Caryopsis** free, laterally compressed, obliquely elliptic-oblong in outline; embryo ± $^1/_4$ as big as caryopsis; hilum very minute, basal.

Species described 2: 1 in tropical America, 1 in trop. Africa: *Orthoclada africana* C.E.Hubb.; sthn trop. Afr.: Zambia.

Oryza L.

(Bambusoideae—Oryzeae)

Wild: 22 (1961); Launert: 31 (1971); Clayton & Renvoize: 71 (1986).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Oryzidium C.E.Hubb. & Schweick.

(Panicoideae—Paniceae—Setariinae)

Simon: 32, 67 (1971); Clayton & Renvoize: 281 (1986); Clayton: 58 (1989).

Monotypic genus: *Oryzidium barnardii* C.E.Hubb. & Schweick., Zambia, Zimbabwe, and sthn Afr.

Oxyrhachis Pilg.

(Panicoideae—Andropogoneae—Rottboelliinae)

Clayton & Renvoize: 855 (1982); Clayton & Renvoize: 368 (1986); Cope: 180 (2002).

Sthn trop. Afr. 1: *Oxyrhachis gracillima* (Baker) C.E.Hubb., Zambia, Mozambique, and sthn Afr.

Oxytenanthera Munro

(Bambusoideae—Bambuseae—Melocanninae)

Rendle: 256 (1899); Burtt Davy *et al.*: 56 (1958); White: 11 (1962); Launert: 17 (1971); Fanshawe: 157 (1972); Clayton & Renvoize: 56 (1986); Gibbs Russell *et al.*: 232 (1990); Chapano: 3 (2002); Coates Palgrave: 96 (2002).

Sthn trop. Afr. 1: *Oxytenanthera abyssinica* (A.Rich.) Munro (=*Bambusa abyssinica* A.Rich.), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and probably sthn Afr.

Panicum L.

(Panicoideae—Paniceae—Setariinae)

Koechlin: 60 (1962); Clayton & Renvoize: 461 (1982); Clayton & Renvoize: 272 (1986); Renvoize: 543 (1989a); Renvoize: 9 (1989b); Chapano: 9 (2002).

Polyneura Peter; Chapano: 10 (2002) as synonym.

Sthn trop. Afr. ± 85, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Paratheria Griseb.

(Panicoideae—Paniceae—Cenchrinae)

Simon: 69 (1971); Clayton & Renvoize: 305 (1986); Clayton: 188 (1989).

Sthn trop. Afr. 1: *Paratheria prostrata* Griseb., Angola, Zambia, and sthn Afr.

Paspalidium Stapf

(Panicoideae—Paniceae—Setariinae)

Stapf: 582 (1920); Simon: 33, 69 (1971); Clayton & Renvoize: 291 (1986); Clayton: 109 (1989).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr. Webster: 439 (1995) sinks *Paspalidium* under *Setaria*.

Paspalum L.

(Panicoideae—Paniceae—Setariinae)

Clayton: 88 (1989); Cope: 4 (1999).

Sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pennisetum Rich.

(Panicoideae—Paniceae—Cenchrinae)

Clayton & Renvoize: 672 (1982); Clayton: 178 (1989); Joubert & Cunningham: 37 (2002).

Beckeropsis Fig. & De Not.; Simon: 29, 64 (1971).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pentaschistis (Nees) Spach

(Arundinoideae—Arundineae)

Clayton: 124 (1970); Simon: 25 (1971); Linder & Ellis: 1 (1990); Cope: 4 (1999).

Sthn trop. Afr. 1: *Pentaschistis natalensis* Stapf, Zimbabwe, Malawi, and sthn Afr.

Perotis Aiton

(Chloridoideae—Cynodonteae—Zoysiinae)

Simon: 38 (1971); Cope: 611 (1995); Cope: 249 (1999).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Phacelurus Griseb.

(Panicoideae—Andropogoneae—Rottboelliinae)

Clayton: 175 (1978b); Clayton & Renvoize: 845 (1982); Cope: 159 (2002).

Jardinea Steud.; Koechlin: 122 (1962); Simon: 53 (1971). *Thyrsia* Stapf; Simon: 53 (1971).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

*Phalaris L.

(Pooideae—Aveneae—Aveninae)

Launert: 81 (1971); Simon: 36 (1971); Clayton & Renvoize: 133 (1986); Chapano: 3 (2002).

Introduced widespread weeds or escapes from cultivation; **Phalaris minor* Retz. recorded from Zimbabwe and sthn Afr.

Phragmites Adans.

(Arundinoideae—Arundineae)

Launert: 91 (1971); Clayton & Renvoize: 182 (1986).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Phyllorachis Trimen

(Bambusoideae—Phyllorachideae)

Trimen: 353 (1879); Launert: 37 (1971); Simon: 36 (1971); Clayton & Renvoize: 75 (1986); Watson & Dallwitz: 731 (1994).

Perennial grasses, sometimes of shrubby habit, with branched slender culms. **Leaf blade** lanceolate, narrowly elliptic to oblong-lanceolate; *ligule* small, ciliate. **Inflorescence** spike-like, terminal, consisting of short racemes inserted along a leaf-like rachis; *axillary inflorescences* all bisexual; racemes short, usually not more than 1 or 2; spikelets longer than those of terminal inflorescences, with elongated stigmas protruding from subtending leafsheaths; *terminal inflorescences* bisexual, lowermost spikelet of each raceme female, the following male, sometimes reduced spikelets present; rachilla not extended. **Male spikelets**: *lower glume* rather narrow, almost subulate, acute; *upper one* 1-nerved, ovate-oblong, up to $^2/_3$ as long as spikelet; *lemma* of inferior floret 3-nerved, coriaceous; *lemma* of upper floret 5–7-nerved, thinly coriaceous, keeled, its *palea* 2-nerved; stamens 6. **Female spikelets**: *lower glume* subulate or even setaceous; *upper one* narrowly ovate to oblong, up to half as long as spikelet, 5–9-nerved; *lemma* of lower floret embracing upper floret, dorsally with a longitudinal furrow, rather rigid, many-nerved; *lemma* of upper floret 11–many-nerved, membranous to thinly coriaceous, its *palea* 8–12-nerved. **Caryopsis** free, elliptic-oblong in outline, with a rather shallow longitudinal furrow; embryo minute; hilum linear, almost as long as caryopsis.

Monospecific: *Phyllorachis sagittata* Trimen, trop. Africa; sthn trop. Afr.: Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Piptophyllum C.E.Hubb.

(Arundinoideae—Arundineae)

Hubbard: 53 (1957b); Clayton & Renvoize: 171 (1986); Watson & Dallwitz: 737 (1994).

Caespitose perennials with very slender, erect, simple culms densely covered at base with woolly fibrous remains of old leaf sheaths. **Leaf blade** filiform, involute, rigid, at length disarticulating from sheath; *ligule* reduced to a series of short cilia. **Inflorescence** a lanceolate-oblong to narrowly oblong panicle with capillary branches. **Spikelets** oblong to cuneate, laterally compressed, aristate; rachilla disarticulating above glumes and between florets. **Florets** 2, bisexual; *callus* very short, obtuse, densely bearded with short hairs. **Glumes** persistent, slightly unequal, lanceolate to oblong, acute or minutely toothed at apex, membranous, 1-nerved; *lemmas* longer than glumes, usually 5–9-nerved, narrowly ovate to ovate-oblong with bilobed apex, with a slightly twisted awn between lobes; *palea* about as long as lemmas, lanceolate-oblong, obtuse or minutely bifid, 2-keeled, membranous. **Lodicules** 2, cuneate, minute. **Stamens** 3; anthers linear-oblong. **Ovary** glabrous; styles free, terminal, short; stigmas plumose.

Monotypic: *Piptophyllum welwitschii* (Rendle) C.E.Hubb., known only from Angola.

Poa L.

(Pooideae—Poeae)

Launert: 47 (1971); Clayton & Renvoize: 101 (1986); Phillips: 127 (1989).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Poecilostachys Hack.

(Panicoideae—Paniceae—Setariinae)

Hackel: 131 (1884); Clayton & Renvoize: 268 (1986); Clayton: 3 (1989); Van der Zon: 188 (1993); Watson & Dallwitz: 754 (1994).

Chloachne Stapf; Simon: 30 (1971); Clayton & Renvoize: 545 (1982).

Trailing perennials, often rooting at nodes; culms up to ± 1 m high/long. **Leaf blade** lanceolate. **Inflorescence** of lax racemes along a central axis; spikelets in pairs or little clusters. **Spikelet** laterally compressed, lanceolate, 6–8 mm long; *glumes* $^1/_3$–$^3/_4$ as long as spikelet, lower one acute to acuminate, upper one armed with stiff bristles based on yellowish tubercles. **Florets** 2; *lower floret* sterile, proximal lemma awnless, 7–9-nerved; *upper floret* bisexual, upper lemma strongly laterally compressed, membranous to cartilaginous with flat or involute margins. **Lodicules** 2, fleshy, joined. **Stamens** 3. **Ovary** glabrous; stigmas 2. **Caryopsis** not noticeably compressed; hilum long-linear.

Species ± 20, all but one confined to Madagascar; sthn trop. Afr. 1: *Poecilostachys oplismenoides* (Hackel) Clayton, Zambia, Zimbabwe, Malawi, Mozambique.

Pogonarthria Stapf

(Chloridoideae—Eragrostideae—Eleusininae)

Rendle: 232 (1899); Clayton & Renvoize: 220 (1986); Cope: 148 (1999).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Pogonochloa C.E.Hubb.

(Chloridoideae—Cynodonteae—Chloridinae)

Hubbard: t. 3421 (1940b); Simon: 25, 59 (1971); Clayton & Renvoize: 244 (1986); Watson & Dallwitz: 759 (1994); Cope: 244 (1999); Chapano: 9 (2002).

Perennials with short, oblique rhizome; culms usually erect with leaves confined to lower $^1/_3$. **Leaves**: lowermost sheaths densely imbricate, loose, persistent, irregularly splitting; leaf blades flat, linear-lanceolate, glaucous, rigid, narrowed at apex into a hard blunt point. **Inflorescence** a spiciform head of numerous short, closely spaced racemes on an elongated axis. **Spikelets** 2- or 3-flowered; *second floret* male or sterile; *third floret* reduced to an *awn*, laterally compressed, alternate in 2 rows on a tough axis, shortly pedicellate, disarticulating above glumes; *glumes* subequal, 1-nerved, membranous, keeled, as long as spikelet and enclosing florets, shortly awned; *fertile lemma* much shorter than glumes, membranous, entire and acute at apex, with a long flexuous terminal *awn*. **Caryopsis** fusiform.

Monotypic genus: *Pogonochloa greenwayi* C.E.Hubb., known only from Zambia and Zimbabwe.

Polypogon Desf.

(Pooideae—Aveneae—Alopecurinae)

Launert: 83 (1971); Simon: 16 (1971); Clayton & Renvoize: 139 (1986); Chapano: 4 (2002).

Sthn trop. Afr. 3 (2 exotic), Angola, Zimbabwe, and sthn Afr.

Pseudechinolaena Stapf

(Panicoideae—Paniceae—Setariinae)

Stapf: 494 (1919); Clayton & Renvoize: 545 (1982); Clayton: 3 (1989).

Sthn trop. Afr. 1: *Pseudechinolaena polystachya* (Kunth) Stapf, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Rhytachne Desv.

(Panicoideae—Andropogoneae—Rottboelliinae)

Clayton: 767 (1978a); Clayton & Renvoize: 843 (1982); Cope: 168 (2002).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Richardsiella Elffers & Kenn.-O'Byrne

(Chloridoideae—Eragrostideae—Eleusininae)

Elffers & Kennedy-O'Byrne: 455 (1957); Simon: 62 (1971); Clayton & Renvoize: 217 (1986); Watson & Dallwitz: 827 (1994); Cope: 148 (1999).

Delicate, low annuals; culms erect, stiff. **Leaf blade** flat or involute on drying. **Inflorescence** comprising several distichously arranged racemes on an elongated central axis, this with a naked filiform apex; racemes delicately incurved when dry, terminating in a naked bristle, spikelets subsessile, contiguous, biseriate, spreading at right angles. **Spikelets** 6–12-flowered, laterally compressed, disarticulating above glumes and between florets; *glumes* 1-nerved, membranous, lightly keeled, shortly awned at apex, lower glume shorter than spikelet, upper glume as long as spikelet; *lemmas* 1-nerved, membranous, dorsally rounded, ciliate on margins, obtuse to obscurely emarginate at apex, sometimes mucronate; *palea* keels pectinate-ciliate. **Caryopsis** ellipsoid, with free pericarp.

Monotypic: *Richardsiella eruciformis* Elffers & Kenn.-O'Byrne, southern Democratic Republic of the Congo and Zambia.

Rottboellia L.f.

(Panicoideae—Andropogoneae—Rottboelliinae)

Rendle: 139 (1899); Clayton & Renvoize: 399 (1986);Veldkamp *et al.*: 281 (1986); Cope: 174 (2002).

Robynsiochloa Jacq.-Fél.; Simon: 53 (1971); Dujardin: 373 (1978).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Saccharum L.

(Panicoideae—Andropogoneae—Saccharinae)

Linnaeus: 54 (1753); Clayton & Renvoize: 704 (1982); Clayton & Renvoize: 330 (1986); Watson & Dallwitz: 833 (1994); Clayton: 4 (2002).

Rhizomatous perennials; culms 2–4 m high or more. **Inflorescence** a panicle, often large and plumose, bearing numerous racemes on its branches; racemes loose, fragile, with slender internodes. **Spikelets** alike, paired, one sessile, one pedicelled, lanceolate, enveloped in long silky hairs from cal-

lus. **Lower glume** membranous or sometimes subcoriaceous below, flat or rounded on back. **Lower floret** represented by a short hyaline lemma. **Upper lemma** entire or bidentate, awned or awnless, sometimes almost suppressed. **Stamens** 2.

Species 35–40, throughout tropics and subtropics; sthn trop. Afr. 1: *Saccharum spontaneum* L. subsp. *aegyptiacum* (Willd.) Hack., Malawi.

Sacciolepis Nash

(Panicoideae—Paniceae—Setariinae)

Simon: 387 (1972); Clayton & Renvoize: 454 (1982); Clayton & Renvoize: 277 (1986); Clayton: 41 (1989).

Sthn trop. Afr. 12, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sartidia De Winter

(Arundinoideae—Aristideae)

Melderis: 95 (1971); Clayton & Renvoize: 185 (1986).

Sthn trop. Afr. 1: *Sartidia angolensis* (C.E.Hubb.) De Winter, Angola, Zambia, Zimbabwe, and sthn Afr.

Schizachyrium Nees

(Panicoideae—Andropogoneae—Andropogoninae)

Koechlin: 155 (1962); Clayton & Renvoize: 754 (1982); Sales: 81 (2002).

Sthn trop. Afr. 9, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schmidtia Steud. ex J.A.Schmidt

(Chloridoideae—Pappophoreae)

Renvoize: 393 (1968); Launert: 149 (1971); Clayton & Renvoize: 189 (1986).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Schoenefeldia Kunth

(Chloridoideae—Cynodonteae—Chloridinae)

Simon: 25 (1971); Cope: 244 (1999).

Sthn trop. Afr. 1: *Schoenefeldia transiens* (Pilg.) Chiov., Zimbabwe, Mozambique, and sthn Afr.

Sclerodactylon Stapf

(Chloridoideae—Eragrostideae—Eleusininae)

Stapf: 318 (1911a); Clayton & Renvoize: 222 (1986); Watson & Dallwitz: 853 (1994); Cope: 162 (1999).

Densely caespitose glaucous perennials, sometimes with creeping stolons; culms erect, straight and usually simple. **Leaves** all basal; blade subulate, cylindric or ± compressed and elliptic in section, glabrous, pungent. **Inflorescence** of paired or digitate racemes; racemes with imbricate, biseriate, sessile or subsessile spikelets and terminating in an abortive spikelet. **Spikelets** several-flowered, laterally compressed, disarticulating between florets or several florets falling together, glabrous; *glumes* 1-nerved, unequal, keeled, coriaceous, shorter than lemmas; *lemmas* 3-nerved, keeled, coriaceous, acute and muticous or mucronulate at apex; *palea* with winged keels. **Caryopsis** elliptic, smooth; pericarp free.

Monotypic genus: *Sclerodactylon macrostachyum* (Benth.) A.Camus, Ocean islands and the adjacent coast of E Africa; sthn trop. Afr.: Mozambique.

Sehima Forssk.

(Panicoideae—Andropogoneae—Ischaeminae)

Clayton & Renvoize: 749 (1982); Cope: 54 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Setaria P.Beauv.

(Panicoideae—Paniceae—Setariinae)

Clayton & Renvoize: 520 (1982); Clayton: 94 (1989); Webster: 439 (1995).

Cymbosetaria Schweick.; Simon: 30, 65 (1971).

Sthn trop. Afr. ± 20, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sinarundinaria Nakai

(Bambusoideae—Bambuseae)

Nakai: 1 (1935); Clayton & Renvoize: 41 (1986); Chao Chi-son & Renvoize: 349 (1989); Van der Zon: 21 (1993).

Arundinaria Michx.: 73 (1803); Burtt Davy *et al.*: 55 (1958); Launert: 14 (1971); Watson & Dallwitz: 142 (1994); White *et al.*: 102 (2001).

Fruticose or arborescent gregarious bamboos 2–20 m tall with stout creeping woody rhizomes; culms woody with many prominent nodes. **Leaves** usually with tessellate venation; laminae finally disarticulating from sheaths. **Inflorescence** terminal and/or lateral, variable, paniculate or racemose. **Spikelets** pedicelled, 1–several-flowered, all bisexual or often uppermost one reduced, linear in outline, cylindrical or laterally compressed, usually somewhat loose; rachilla disarticulating between florets, with joints thickened towards apex; *glumes* 2 (more rarely 1), slightly unequal, much shorter than florets, persistent, few- to many-nerved, membranous; *lemmas* large, membranous, chartaceous or coriaceous, dorsally rounded, 5–13-nerved, usually with transverse veinlets, with apex acute, acuminate or mucronate; *palea* several-nerved, 2-keeled, only little shorter than lemma, often ciliate along keels, embraced by lemma. **Lodicules** 3, relatively large, ovate-lanceolate, ciliate, with nerves in lower part. **Stamens** 3 (very rarely 6). **Ovary** subglobular; styles 2 or rarely 3. **Caryopsis** narrowly oblong in outline, indurate, dorsally rounded, ventrally with a longitudinal furrow; scutellum circular.

Species ± 50: 2 in Central America, 1 in Africa, 2 in Madagascar, the rest in Asia; sthn trop. Afr. 1: *Sinarundinaria alpina* (K.Schum.) Chao & Renvoize, Malawi. Many species have been cultivated for ornamental purposes.

Sorghastrum Nash

(Panicoideae—Andropogoneae—Sorghinae)

Clayton & Renvoize: 731 (1982); Setshogo: 133 (2000); Setshogo: 27 (2002).

Miscanthidium Stapf; Watson & Dallwitz: 609 (1994).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sorghum Moench
(Panicoideae—Andropogoneae—Sorghinae)
Stapf: 104 (1917); Clayton & Renvoize: 726 (1982); Setshogo: 132 (2000); Setshogo: 21 (2002).

Sthn trop. Afr. 3 or 4 (plus hybrids and cultivated species), Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Sporobolus R.Br.
(Chloridoideae—Eragrostideae—Sporobolinae)
Clayton & Renvoize: 224 (1986); Cope: 166 (1999); Chapano: 7 (2002).

Sthn trop. Afr. ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stenotaphrum Trin.
(Panicoideae—Paniceae—Setariinae)
Clayton & Renvoize: 293 (1986); Clayton: 111 (1989).

Sthn trop. Afr. 2, Zimbabwe, Mozambique, and sthn Afr.

Stereochlaena Hack.
(Panicoideae—Paniceae—Digitariinae)
Clayton: 295 (1978c); Clayton & Renvoize: 655 (1982); Clayton: 128 (1989).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Stipagrostis Nees
(Arundinoideae—Aristideae)
Henrard: 1 (1926–1933); Melderis: 131 (1971); Simon: 22, 55 (1971).

Sthn trop. Afr. ± 6, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Streblochaete Pilg.
(Pooideae—Meliceae)
Launert: 66 (1971); Simon: 29, 63 (1971); Clayton & Renvoize: 115 (1986).

Monotypic: *Streblochaete longiarista* (A.Rich.) Pilg.; sthn trop. Afr.: Zambia, Zimbabwe, Malawi, and sthn Afr.

Streptolophus Hughes
(Panicoideae—Paniceae—Cenchrinae)
Hughes: 178 (1923); Clayton & Renvoize: 306 (1986); Watson & Dallwitz: 915 (1994).

Rambling annuals with weak, decumbent to geniculate-ascending, branching culms. **Leaves** sagittate-lanceolate, long-attenuate, prominently nerved, slightly retrorse-scabrid, with a slender petiole densely pubescent at apex, standing out at an angle and holding leaf blade well away from sheath. **Inflorescence** a narrow panicle with primary branches bearing pedunculate clusters of spikelets in which branchlets are reduced to slightly flattened bristles which become ± fused at base. **Spikelets** sessile or subsessile, crowded in clusters becoming reflexed and finally disarticulating from main axis. **Glumes** subequal, rounded, papillose at apex, hyaline, few-nerved, much shorter than spikelet. **Florets**: lower one reduced to a glume as long as spikelet; upper one bisexual. **Lodicules** 2, minute. **Stamens** 3. **Ovary** glabrous; styles long, terminal; stigmas plumose.

Monotypic genus: *Streptolophus sagittifolius* Hughes, known only from Angola.

Styppeiochloa De Winter
(Arundinoideae—Arundineae)
Simon: 26 (1971); Clayton & Renvoize: 172 (1986); Cope: 4 (1999).

Sthn trop. Afr. 1: *Styppeiochloa gynoglossa* (Gooss.) De Winter, Zimbabwe, Mozambique, and sthn Afr.

Tetrapogon Desf.
(Chloridoideae—Cynodonteae—Chloridinae)
Simon: 25 (1971); Clayton & Renvoize: 236 (1986); Cope: 207 (1999).

Sthn trop. Afr. 1: *Tetrapogon tenellus* (Roxb.) Chiov., Angola, Zimbabwe, Mozambique, and sthn Afr.

Thelepogon Roth ex Roem. & Schult.
(Panicoideae—Andropogoneae—Ischaeminae)
Stapf: 34 (1917); Simon: 19, 52 (1971); Clayton & Renvoize: 744 (1982); Cope: 54 (2002).

Sthn trop. Afr. 1: *Thelepogon elegans* Roth ex Roem. & Schult., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Themeda Forssk.
(Panicoideae—Andropogoneae—Anthistiriinae)
Stapf: 415 (1919); Clayton & Renvoize: 829 (1982); Cope: 148 (2002).

Sthn trop. Afr. 1: *Themeda triandra* Forssk., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Trachypogon Nees
(Panicoideae—Andropogoneae—Germainiinae)
Clayton & Renvoize: 338 (1986); Clayton: 19 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tragus Haller
(Chloridoideae—Cynodonteae—Zoysiinae)
Anton: 55 (1981); Cope: 246 (1999).

Sthn trop. Afr. 4, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tricholaena Schrad. ex Schult.
(Panicoideae—Paniceae—Melinidinae)
Clayton & Renvoize: 502 (1982); Zizka: 113 (1989).

Sthn trop. Afr. 1: *Tricholaena monachne* (Trin.) Stapf & C.E.Hubb., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Trichoneura Andersson
(Chloridoideae—Eragrostideae—Eleusininae)
Cope: 43 (1999).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Trichopteryx Nees
(Panicoideae—Arundinelleae)
Conert: 238 (1957); Phipps: 119 (1964); Clayton: 213 (1989).

Sthn trop. Afr. 5, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Tridens Roem. & Schult.

(Chloridoideae—Eragrostideae—Eleusininae)

Roemer & Schultes: 34 (1817); Clayton & Renvoize: 205 (1986).

Gossweilerochloa Renvoize: 525 (1979).

Tufted perennials. **Leaves**: sheaths shiny, persistent; blades linear; *ligule* a line of short hairs. **Inflorescence** a delicate open panicle. **Spikelets** 4–6-flowered, suffused with purple, slightly laterally compressed, plump; lower florets bisexual, upper ones male, all exserted from the glumes. **Glumes** ovate, membranous, 1-nerved. **Lemmas** rounded, nerves and midrib pubescent below, glabrous above, emarginated to bidentate, ovate-oblong, membranous, obtuse, 3-nerved, middle nerve produced into a short, straight, antrorsely scabrid *awn*. **Upper lemma** similar to lower one or somewhat shorter. **Caryopsis** dorsally compressed, dull brown.

Species 18, all in Eastern USA to Argentina except 1: (*Tridens*) *Gossweilerochloa delicatula* Renvoize, Angola.

Tripogon Roem. & Schult.

(Chloridoideae—Eragrostideae—Eleusininae)

Phillips & Launert: 301 (1971); Cope: 29 (1999).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Triraphis R.Br.

(Chloridoideae—Eragrostideae—Eleusininae)

Rendle: 227 (1899); Clayton: 128 (1970); Cope: 20 (1999).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Mozambique, and sthn Afr.

Tristachya Nees

(Panicoideae—Arundinelleae)

Clayton: 204 (1989); Chapano: 14 (2002).

Dolichochaete (C.E.Hubb.) J.B.Phipps; Simon: 23 (1971) as synonym.

Sthn trop. Afr. 11, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Urelytrum Hack.

(Panicoideae—Andropogoneae—Rottboelliinae)

Clayton & Renvoize: 832 (1982); Cope: 151 (2002).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Urochloa P.Beauv.

(Panicoideae—Paniceae—Setariinae)

Clayton & Renvoize: 600 (1982); Clayton: 79 (1989).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Vossia Wall. & Griff.

(Panicoideae—Andropogoneae—Rottboelliinae)

Stapf: 41 (1917); Wild: 18 (1961); Clayton & Renvoize: 831 (1982); Gibbs Russell *et al.*: 353 (1990); Cope: 164 (2002).

Sthn trop. Afr. 1: *Vossia cuspidata* (Roxb.) Griff., Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Willkommia Hack.

(Chloridoideae—Cynodonteae—Chloridinae)

Simon: 25, 59 (1971); Cope: 219 (1999).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, and sthn Afr.

Zonotriche (C.E.Hubb.) J.B.Phipps

(Panicoideae—Arundinelleae)

Phipps: 113 (1964); Bennett: 199 (1980); Clayton & Renvoize: 318 (1986); Clayton: 211 (1989); Watson & Dallwitz: 1021 (1994).

Piptostachya (C.E.Hubb.) J.B. Phipps; Simon: 23 (1971) as synonym.

Tufted perennials up to 1.5 m high; culms slender, erect or ascending. **Inflorescence** a panicle bearing spikelets in triads with connate pedicels; peduncle developing a fragile hook-like flexure at maturity and triads falling entire. **Spikelets** brown, upper florets eventually disarticulating; lower glume $^2/_3$ to as long as spikelet, villose with tubercle-based white or golden hairs; lower lemma 5-nerved; upper lemma with or without hair tufts, bilobed, with a persistent geniculate awn; callus short, broadly rounded; palea keels with or without narrow wings, but these not clasped by the lemma.

Species 3, central Africa; sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

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Pontederiaceae

(Liliidae—Haemodorales)
(Commelinids—Commelinales)

Glen, R.P. in Leistner: 726 (2000). General family reference: Cook: 395 (1998).

Sthn trop. Afr.: genera 3, species 4.

Eichhornia Kunth

Rendle: 66 (1899); Wild: 9 (1961); Lawalrée & Bruynseels: 3 (1981); Catarino & Martins: 22 (1996); Lindsey & Hirt: 1 (1999); Simpson & Sanderson: 28 (2002).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

Heteranthera Ruiz & Pav.

Rendle: 67 (1899); Lawalrée & Bruynseels: 7 (1981); Catarino & Martins: 24 (1996).

Sthn trop. Afr. 1: *Heteranthera callifolia* Kunth, Angola, Zambia, Zimbabwe, Malawi, and sthn Afr.

Monochoria C.Presl

Rendle: 67 (1899); Lawalrée & Bruynseels: 2 (1981); Catarino & Martins: 25 (1996); Glen *et al.*: 10 (2001); Phiri (Unpublished).

Sthn trop. Afr. 1: *Monochoria africana* (Solms) N.E.Br., Angola, Zambia, Malawi, Mozambique, and sthn Afr.

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Potamogetonaceae

(Alismatidae—Najadales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 728 (2000).

Sthn trop. Afr.: genus 1, species 7.

Potamogeton L.

Dandy: 507 (1937); Obermeyer: 60 (1966); Wiegleb: 249 (1988); Hollingsworth *et al.*: 337 (1998); Mapaura (Unpublished).

Sthn trop. Afr. 7, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Restionaceae
(Commelinidae—Restionales)
(Commelinids—Poales)

Archer, C. in Leistner: 729 (2000). General family reference: Linder *et al.*: 653 (2000).

Sthn trop. Afr.: genus 1, species 3.

Restio Rottb.

Linder: 99 (1986); Linder: 623 (1995); Izidine & Bandeira: 59 (2002); Msekandiana & Mlangeni: 37 (2002).

Sthn trop. Afr. 3, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Ruppiaceae
(Alismatidae—Najadales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 733 (2000).

Ruppia L.

Obermeyer: 70 (1966); Hepper: 18 (1968); Symoens: 1 (1977); Lacroix & Kemp: 253 (1997); Haynes *et al.*: 448 (1998).

Species 7 or 8, cosmopolitan, mainly in temperate regions; sthn trop. Afr. 1: *Ruppia maritima* L. var. *maritima*, Angola, and sthn Afr. Sometimes placed under Potamogetonaceae (Brummitt 1992).

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Smilacaceae
(Liliidae—Dioscoreales)
(Monocots—Liliales)

Meyer, N.L. in Leistner: 734 (2000).

Sthn trop. Afr.: genus 1, species 2.

Smilax L.

Baker: 423 (1898); Burtt Davy *et al.*: 95 (1958); White: 15 (1962); Hepper: 111 (1968); Cowley: 1 (1989); Conran: 417 (1998); White *et al.*: 109 (2001); Mapaura (Unpublished).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Strelitziaceae
(Zingiberidae—Zingiberales)
(Commelinids—Zingiberales)

Archer, C. in Leistner: 734 (2000).

Sthn trop. Afr.: genus 1, species 2.

Strelitzia Aiton

Dyer: t. 997 (1946); Manning & Goldblatt: 932 (1989); Andersson: 454 (1998); Coates Palgrave: 118 (2002); Mapaura (Unpublished).

Sthn trop. Afr. 2, Zimbabwe, Mozambique.

References

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Taccaceae
(Liliidae—Haemodorales)
(Monocots—Dioscoreales; included in Dioscoreaceae)

Perennial herbs with a tuberous or elongated rhizome and 1–3 basal leaves. **Leaves** large, long-petiolate, 3-partite, each part 1–3-pinnatisect; petiole up to 1 m long, longitudinally ridged. **Inflorescence** terminal, usually on a solitary flowering stem, umbellate, surrounded by 4–12 large involucral bracts and by many filiform floral bracts. **Flowers** bisexual, regular, epigynous. **Tepals** 6, petaloid, connate at base, persistent. **Stamens** 6, in 2 whorls, adnate to base of tepals; filaments short, flat, somewhat petaloid, forming together with the broad connective a hood-like structure over the solitary anther; anther 2-thecous, introrse, opening by longitudinal slits. **Ovary** inferior, 1-locular, 3-carpellate, 6-ribbed, with 3 parietal placentas, each with many anatropous to campylotropous ovules. **Fruit** a berry. **Seeds** longitudinally ridged, surrounded by a thin fleshy aril when fresh; embryo small, in copious starchless endosperm rich in fat and protein. $x = 15$.

Genus 1, species 10, pantropical Old World, with 1 or more in New World; sthn trop. Afr.: genus 1, species 1.

Carter: 1 (1962); Hepper: 176 (1968); Drenth: 367 (1972); Drenth: 806 (1976); Mabberley: 697 (1997); Kubitzki: 425 (1998).

Tacca J.R.Forst. & G.Forst.

Forster & Forster: 35 (1775), name conserved; Burtt Davy *et al.*: 97 (1958); Carter: 1 (1962); Hepper: 1 (1968); Drenth: 374 (1972); Lisowski *et al.*: 3 (1976); Kubitzki: 425 (1998).

Schizocapsa Hance.

Description as for family.

Species 10, pantropical; sthn trop. Afr. 1: *Tacca leontopetaloides* (L.) Kuntze, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

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Tecophilaeaceae
(Liliidae—Asparagales)
(Monocots—Asparagales)

Archer, R.H. in Leistner: 735 (2000).

Additional family characters: **Tubers** or corms often superposed to form a vertical series. **Roots** emerging from sides of tubers. **Seeds** containing chalazosperm (nutrient tissue developing at chalazal end).

Emended family notes: Genera 8, species 26, Chile, California and tropical and southern Africa; sthn trop. Afr.: genera 3, species 4.

Oliver: t. 1965 (1891); Carter 1: (1966); Dahlgren: 79 (1988) under Cyanastraceae; Mabberley: 202 (1997) under Cyanastraceae; Takhtajan: 494 (1997) under Cyanastraeeae; Brummitt *et al.*: 769 (1998); Simpson & Rudall: 429 (1998); Cowley & Brummitt: 18 (2001).

Key to genera

1a Plants with leafy stems; flowers ± solitary in leaf axils; plants perennating by 1–several irregular tubers ..... **Walleria**

1b Plants without stems; flowers in terminal scapose inflorescences; plants perennating by corms often superposed one on top of the other:

2a Leaves ± 4, with bases surrounding the lower part of the scape, attenuate into a ± indistinctly defined petiole; tepals white; anthers dehiscing by a short, clavate, introrse slit ..... **Kabuyea**

2b Leaves solitary on upper surface of corm, not surrounding the base of the scape, distinctly petioled; tepals blue; anthers dehiscing by an apical pore ..... **Cyanastrum**

Cyanastrum Oliv.

Oliver: t. 1965 (1891); Carter: 190 (1962); Carter: 1 (1966); Simpson & Rudall: 434 (1998); Brummitt *et al.*: 775 (1998); Cowley & Brummitt: 22 (2001).

Geophytes with annual aerial parts; tubers depressed-globose to disc-like, superposed to forming a vertical series, not tunicated; roots emerging from sides of tuber. **Leaves** basal, petiolate to subsessile, rolled in bud, ovate to ovate-orbicular, decurrent to cordate, with schizogenous oil channels. **Inflorescence** racemose, terminating a flowering stem, sometimes appearing before leaves; bracts and bracteoles present or absent. **Perianth**: segments forming a very short tube at base, blue or white. **Stamens** all perfect and similar, arising on perianth at throat of tube. **Seeds** containing chalazosperm (nutrient tissue developing at chalazal end); embryo subglobose, containing starch.

Species 3, trop. Africa from Nigeria to Tanzania and Mozambique; sthn trop. Afr. 1: *Cyanastrum johnstonii* Baker, Zambia, Mozambique.

Kabuyea Brummitt

Brummitt in Brummitt *et al.*: 771 (1998); Simpson & Rudall: 434 (1998); Cowley & Brummitt: 20 (2001).

Perennial acaulescent herbs; corms several, superposed one above the other. **Leaves** basal, ± 4, closely enfolding base of scape, sheathed by 1 or more outer cataphylls; inner cataphylls present or absent, not sheathing; lamina long-attenuate at base into an indistinctly defined petiole. **Inflorescence** scapose with flowers racemosely arranged. **Tepals** white, ± free to base. **Stamens**: anther thecae oblong, opening introrsely by an apical pore. **Ovary** half-inferior; ovules 2 per carpel, only 1 developing into a seed. **Capsule** with only 1(2) carpels developing a seed; fertile carpel globose, dehiscing by a complete longitudinal split. **Seeds** globose; endosperm present; chalazosperm lacking.

Monotypic genus: *Kabuyea hostifolia* (Engl.) Brummitt, eastern trop. Africa; sthn trop. Afr.: Mozambique.

Walleria J.Kirk

Sterling: 115 (1974); Simpson & Rudall: 435 (1998); Cowley & Brummitt: 18 (2001).

Sthn trop. Afr. 2, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Typhaceae
(Commelinidae—Typhales)
(Commelinids—Poales)

Glen, R.P. in Leistner: 736 (2000).

Sthn trop. Afr.: genus 1, species 3.

Typha L.

Anderson: 53 (1966); Hepper: 129 (1968); Napper: 1 (1971); Kubitzki: 460 (1998); Kuehn & White: 906 (1999).

Sthn trop. Afr. 3, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Velloziaceae
(Liliidae—Liliales)
(Monocots—Pandanales)

Archer, R.H. in Leistner: 736 (2000).

Sthn trop. Afr.: genus 1, species 19.

Xerophyta Juss.

Smith & Ayensu: 181 (1974); De Melo *et al.*: 257 (1997); Kubitzki: 459 (1998); White *et al.*: 109 (2001); Behnke *et al.*: 55 (2002).

Vellozia Vand., in part; Burtt Davy *et al.*: 100 (1958); White: 17 (1962).

Sthn trop. Afr. 19, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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Xyridaceae
(Commelinidae—Commelinales)
(Commelinids—Poales)

Glen, R.P. in Leistner: 737 (2000).

Sthn trop. Afr.: genus 1, species ± 40.

Xyris L.

Rendle: 67 (1899); Lock: 883: (1998); Lock: 301 (1999a); Lock: 1 (1999b); Rudall & Sajo: 795 (1999); Lisowski *et al.*: 1 (2001).

Sthn trop. Afr.: ± 40, Angola, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

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RUDALL, P.J. & SAJO, M.G. 1999. Systematic position of *Xyris*: flower and seed anatomy. *International Journal of Plant Sciences* 160(4): 795–808.

Zannichelliaceae
(Alismatidae—Alismatales)
(Monocots—Alismatales; included in Potamogetonaceae)

Glen, R.P. in Leistner: 738 (2000).

Sthn trop. Afr. (unconfirmed): genus 1, species 1.

Zannichellia L.

Bennett: 224 (1901); Reinecke: 93 (1964); Obermeyer: 77 (1966); Tomlinson & Posluszny: 273 (1976); Cook: 222 (1990); Haynes *et al.*: 473 (1998); Beentje: 1 (2000).

Sthn trop. Afr. ?1: *Zannichellia palustris* L., no firm record for the region was seen. Recorded from sthn Afr.

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TOMLINSON, P.B. & POSLUSZNY, U. 1976. Generic limits in the Zannichelliaceae (sensu Dumortier). *Taxon* 25(2/3): 273–279.

Zingiberaceae
(Zingiberidae—Zingiberales)
(Commelinids—Zingiberales)

Archer, C. in Leistner: 739 (2000).

Sthn trop. Afr.: genera 4, species ± 16.

Key to genera

1a Style exserted well beyond the anther; the long, subulate anther crest is wrapped around the style ..... ***Zingiber**

1b Style not exserted beyond the anther; anther crest, if present, not wrapped around the style:

2a Inflorescence a many-flowered panicle with an elongated axis; flowers, including the pedicel, shorter than 25 mm ..... **Renealmia**

2b Inflorescence condensed, without an elongated axis or, if the axis is elongated, then each bract subtends only 1 flower, which, with its pedicel, is longer than 25 mm:

3a Apex of stamen petaloid, at least twice as long as the basal anther; small plants, often flowering before the leaves are fully developed; leaf sheaths usually not forming a pseudostem, at least at time of flowering ..... **Siphonochilus**

3b Apex of stamen 2- or 3-lobed or truncate, shorter than the anther; large plants with leafy shoots fully developed at flowering time; leaf sheaths always forming a distinct pseudostem ..... **Afromomum**

Afromomum K.Schum.

Schumann: 201 (1904); Loesener: 596 (1930); Gossweiler & Mendonça: 82, etc. (1939); Koechlin: 42 (1965); Fanshawe: 151 (1972); Lock: 299 (1980); Lock: 837 (1984); Lock: 22 (1985); Larsen *et al.*: 493 (1998); Phiri (Unpublished).

Perennial herbs with erect leafy stems and extensive rhizome system. **Leaves** with long sheathing bases forming a pseudostem; base of lamina contracted into a pseudopetiole; ligule present. **Inflorescence**: flowers usually clustered at apex of separate leafless shoots, sometimes arising on rhizomes with only apical part showing; flowers each subtended by 2 subopposite bracts. **Flowers** bisexual, large, very irregular. **Calyx**: tube split down one side. **Corolla**: tube narrow, ± as long as calyx; lateral petals narrow; posterior petal larger, forming a hood-like structure; basal half of petals and androecium fused into a tube; labellum broad, petaloid, very delicate and suberect, or narrower, thicker and decurved. **Stamen**: filament strap-shaped, apex usually 3-lobed; thecae 2, subterminal; lateral staminodes small and tooth-like. **Ovary** 3-locular; style filiform; stigma trumpet-shaped, with ciliate margins; stylodes at base of style subulate or contorted. **Fruit** a large indehiscent berry with tough fleshy wall, usually red when ripe, with apical beak formed by persistent calyx. **Seeds** surrounded by white, translucent aril, cohering into 3 masses around delicate axile placenta.

Species ± 50, trop. Africa, Mascarenes and Madagascar; sthn trop. Afr. ± 10, Angola, Zambia, Zimbabwe, Malawi, Mozambique.

Renealmia L.f.

Linnaeus filius: 7, 79 (1782 '1781') name conserved; Schumann: 282 (1904); Loesener: 608 (1930); Gossweiler & Mendonça: 60, etc. (1939); Koechlin: 27 (1965); Larsen *et al.*: 490 (1998).

Perennial herbs with leafy pseudostems and well-developed rhizomes. **Leaves** with long, sheathing bases, narrowly ovate to obovate, attenuate at base into a pseudopetiole; ligule very short and stiff. **Inflorescence** paniculate, terminal on a separate leafless shoot, usually lax; bracts ovate, subtending 1- to several-flowered cincinni; bracteoles tubular. **Calyx** tubular, 3-dentate at apex, persistent in fruit. **Corolla** 3-lobed; tube somewhat longer than calyx; labellum 3-lobed, erect or spreading, longer than petals. **Stamen** subsessile; anther without crest. **Ovary** 3-locular, with several to many ovules; style filiform; stigma bilobed; stylodes forming a solid mass around style base. **Fruit** a fleshy capsule, dehiscing from base to apex. **Seeds** angular, surrounded by a fimbriate aril.

Species ± 55 in tropical America, 10–20 in Africa; sthn trop. Afr. 1: *Renealmia africana* Benth. ex Hook.f., Angola.

Siphonochilus J.M.Wood & Franks

Burtt: 369 (1982); Lock: 14 (1985); Larsen *et al.*: 486 (1998); Archer: 739 (2000).

Kaempferia L. subgen. *Cienkowskia* K.Schum.: 67 (1904).

Sthn trop. Afr. 4, Zambia, Zimbabwe, Malawi, Mozambique, and sthn Afr.

***Zingiber** Boehm.

Boehmer: 89 (1760), name conserved; Schumann: 165 (1904); Loesener: 586 (1930); Larsen *et al.*: 488 (1998).

Perennial herbs with creeping, aromatic, fleshy rhizome; leafy stems usually separate from flowering ones. **Inflorescence** cylindric to ovoid; peduncle long; bracts closely imbricate or with free apices, often brightly coloured, each enclosing a 1(2–4)-flowered cincinnus. **Calyx** tubular, 3-denticulate at apex, split down one side. **Corolla**: tube ± as long as bracts, lateral lobes connate and fused to centre of labellum in lower third; labellum 3-lobed. **Stamen** with short filament connective apically produced into a long, subulate appendage wrapped around style. **Ovary** 3-locular; ovules many; style slender; stigma small, subglobose. **Fruit** a capsule, fleshy at first, later leathery and dehiscent. **Seeds** many, with white, lacerate aril. $x = 11$.

Species 60, Indomalesia to E Asia and tropical Australia. **Zingiber officinale* Roscoe (Ginger) and **Z. zerumbet* (L.) Sm. are cultivated and may persist as relics of cultivation.

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Zosteraceae

(Alismatidae—Alismatales)
(Monocots—Alismatales)

Glen, R.P. in Leistner: 740 (2000).

Sthn trop. Afr.: genus 1, species 1.

Zostera L.

Bennett: 225 (1901); Obermeyer: 58 (1966); Isaac: 30 (1968); Cook: 224 (1990); Bandeira: 191 (2002).

Sthn trop. Afr. 1: *Zostera capensis* Setch., Angola, Mozambique, and sthn Afr.

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GLOSSARY

This list is based on the glossary in Retief & Herman (1997, Plants of the northern provinces of South Africa: keys and diagnostic characters. *Strelitzia* 6) which was compiled mainly from Jackson (1928, *A glossary of botanic terms*, edn 4); Exell & Wild (1960, *Flora zambesiaca* 1,1: 42–54); Radford *et al.* (1974, *Vascular plant systematics*) and Little & Jones (1980, *A dictionary of botany*). Much additional material was gained, chiefly from Orchard (1999, *Species plantarum: Flora of the world. Introduction to the series*).

Abbreviations: *adj.*, adjective; *pl.*, plural; *sing.*, singular; *syn.*, synonym; *vb.*, verb.

A

a- (*prefix*): without, lacking.

abaxial: applied to the side or surface facing away from the axis or stem (compare **adaxial**).

abortion: suppression of parts which are usually present.

abscission: the normal shedding from a plant of an organ that is mature or aged.

acarodomatium (*pl.* **acarodomatia**): a small cavity of very varying form, found on almost any vegetative part of the plant, which is inhabited, or thought to be inhabited, by mites; commonest types are small pockets or pits in axils of main veins with midrib on lower leaf surface.

acaulescent/acauline: stemless or seemingly so.

accrescent: increasing in size, e.g. the calyx of some plants in the fruiting stage.

accumbent: lying against, as the **cotyledons** (in some Brassicaceae) with their edges against the **radicle**.

achene: a small dry fruit, not splitting when ripe, formed from a **superior** ovary of one **carpel** and containing a single seed, with the seed coat free from the fruit wall, as in *Clematis* (Ranunculaceae) (compare **cypsela**).

acicular: very narrow, stiff and pointed, needle-like.

acinaciform: scimitar-shaped; shaped like a short, curved, single-edged sword.

acropetal: arising or developing in a longitudinal sequence towards the apex.

actinomorphic: applied to flowers which are radially symmetrical, i.e. capable of being bisected into similar halves in more than one vertical plane, forming mirror images (= **regular**) (compare **irregular**, **zygomorphic**).

aculeate: armed with **prickles**, as distinct from **spines**.

aculeolate: with small **prickles**.

acumen: a long, tapering point.

acuminate: having a long, slender, sharp point with a terminal angle less than 45°, with margins straight to convex.

acute: sharp-pointed, with a terminal angle between 45° and 90° with margins straight to convex.

adaxial: applied to the side facing the stem or axis (compare **abaxial**).

adnate: fused to an organ of a different kind, e.g. an ovary to the calyx tube.

adpressed: see **appressed**.

adventitious: applied to plant organs produced in an unusual or irregular position or at an unusual time of development, as in adventitious buds, roots or shoots.

adventive: introduced recently by chance to an area (compare **introduced, naturalised**).

aerenchyma (*adj.* **aerenchymatous**): tissue of thin-walled cells and large intercellular spaces, found especially in water- and marsh plants.

aestivation: the manner in which sepals and petals are arranged in a bud (compare **vernation**).

aggregate fruit: a cluster of fruits formed from the free **carpels** of one flower, e.g. the many small **drupes** in the 'fruit' of *Rubus* (Rosaceae) (compare **syncarp**).

alate: **winged**, as in certain stems or seeds; having wing-like extensions.

albumen (*adj.* **albuminous**): starchy or other nutritive material within the embryo; an older term largely replaced by the term **endosperm**.

allopatric (of two or more taxa): having different ranges of distribution (compare **sympatric**).

alternate: applied to leaves and other organs inserted singly at different levels along the axis.

alternipetalous: applied to floral parts arising alternately with the petals.

alternisepalous: applied to floral parts arising alternately with the sepals.

alveola (*pl.* **alveolae**): small pits on the surface, as on the receptacle of many of the Asteraceae (see **alveolate**).

alveolate: honeycombed; having deep angular sides, like the cavities of a honeycomb.

amphistomatic/amphistomatous: with stomata on both upper and lower leaf surfaces.

amphitropous ovule: an ovule which is attached near its middle and is bent in the form of a U, so that the ovule tip and stalk base are near each other.

amplexicaul: stem-clasping, as when the base of the leaf is dilated and embraces the stem.

ampullaceous: swollen out in flask-shape.

anacampylotropous: applied to an **ovule** intermediate in structure between **anatropous** and **campylotropous**.

anantherous: of a filament without anther.

anastomosis (*vb.* **anastomose**): union of one vein with another, the connections forming a network.

anatropous: applied to an **ovule** that is inverted, so that the funicle is basally attached near the adjoining **micropyle** area, and the **chalaza** is at the opposite end.

ancipitous/ancipital: two-edged; flattened or compressed, as in stems of certain Poaceae.

androecium: the **stamens** and accessories of one flower.

androgynophore: a stalk supporting both **androecium** and **gynoecium** of a flower above the level of insertion of the **perianth**.

androphore: a stalk bearing the **androecium**.

andropodium: the structure on which the stamens arise (in some

Podostemaceae).

anemochoric: dispersed by wind.

anemophilous: pollinated or dispersed by wind (compare **entomophilous**, **hydrophilous**, **ornithophilous**).

aneuploid: having a chromosome number that is not an exact multiple of the **haploid** number, because one chromosome set is incomplete.

angiosperm: a seed-bearing plant whose ovules, and hence seeds, develop within an ovary (compare **gymnosperm**).

angustiseptate: with narrow partitions (compare **latiseptate**).

anisocytic: of a **stoma** with three subsidiary cells, one distinctly smaller than the other two, surrounding the stoma.

anisophyllous: with the two leaves of a pair of unequal size or shape.

annual: a plant whose life span ends within one year after germination.

annular: arranged in a circle.

annulate: ring-shaped; having an **annulus**.

annulus: any ring or ring-like structure.

anomocytic: of a **stoma** surrounded by a limited number of cells that are indistinguishable from those of the remainder of the epidermis.

antepetalous (e.g. of **stamens**): **opposite** the petals.

antesepalous (e.g. of **stamens**): **opposite** the sepals.

anterior (applied to floral organs): in a position most remote from the axis (compare **posterior/posticous**).

anthela (*adj.* **anthelate**): a **panicle** in which the lateral axes overtop the main axis.

anther: the part of the stamen which contains the pollen, usually comprising four **microsporangia** or **pollen sacs**, two in each half or lobe of the anther; the tissue separating the two sacs in each half usually disintegrates before **anthesis**, resulting in a 2-thecous/bithecous/2-locular/2-celled anther.

anther canal (in orchids): the narrow **basal** portion of a **pollinium**.

antherode: a sterile anther, often rudimentary.

anther slits: see **gynostegial grooves**.

anther wings (in Asclepiadoideae—Apocynaceae): see **gynostegial grooves**.

anthesis: period during which the flower is open.

anthocarp: a false fruit formed by the union of floral parts with the fruit (as in Nyctaginaceae).

anthophore: a short stalk between calyx and petals (e.g. in *Dianthus*—Caryophyllaceae).

anticous/antical: applied to that which is most remote or turned away from the axis; occasionally employed for **introrse**, as applied to anthers (compare **posticous**).

antrorse: bent or directed towards the apex or forward (compare **retrorse**).

apex (*pl.* **apices**): tip; topmost part or terminal end.

aphlebia: stipular outgrowths which occur on the **rachis**.

apicule/apiculum/apiculus (*adj.* **apiculate**): a short point.

apocarpous: with **carpels** free from one another.

apophysis (*pl.* **apophyses**): the rounded, exposed thickening on the scales of certain pine cones.

apotropous: of an **anatropous** ovule with ventral **raphe**.

appendiculate/appendaged: with small appendages; hanging in small fragments.

appressed: lying close to and flat along the surface.

aquatic: living in water.

arachnoid: cobwebby by soft and fine entangled hairs which are longer than in **tomentose**.

araneose/araneous: see **arachnoid**.

arborescent: having the shape or characteristic of a tree.

arcuate: curved like a bow.

areolate: divided into distinct spaces.

areole: a small pit or raised spot, often bearing a tuft of hairs or spines; a space marked out on a surface; a small area in a leaf between small veins.

aril: an appendage covering or partly enclosing the seed and arising from the **funicle** (stalk) of the seed.

arillode: a false **aril**; a fleshy coat derived from the orifice or **micropylar** rim of the outer **integument** instead of the stalk of an ovule.

arillus (*pl.* **arilli**; *adj.* **arillate**): see **aril**.

arista (*pl.* **aristae**): a bristle-like appendage as on **glumes** of many Poaceae; a bristly **awn**.

aristate: with a long, bristle-like point.

article: one of the segments of a jointed fruit, such as a **loment**, or **internodes** of the branchlets of e.g. *Casuarinaceae or Salicornieae—Chenopodiaceae.

articulate(d): jointed or separating at a certain point and leaving a clean scar.

articulation: a joint, e.g. between the **column** and the lower part of the **lemma** in *Aristida* (Poaceae).

ascendent/ascending: growing erect after an oblique or ± horizontal beginning.

ascending (of **aestivation**): sepals or petals arranged in the bud so that the upper margins of the lowest member overlap the lower margin of the member above it.

asperous: rough, harsh to the touch.

asperulate/asperulous: slightly rough to the touch.

ategmic (of a seed): without covering.

atrocastaneous: dark chestnut-coloured; dark brown.

attenuate: tapering gradually.

aulacospermous (of seeds): furrowed.

auricle (*adj.* **auricled/auriculate**): an ear-like lobe or appendage at the base of a leaf or other organ.

autogamous: self-fertilising.

awn: a fine bristle usually terminating an organ, as at the tip of the **glumes** and **lemmas** of many Poaceae.

axil: the angle between leaf or bract and the axis bearing it.

axile placentation: **placentation** with the **ovules** borne on the axis or the inner angle of the locules of a **syncarpous** ovary (see also **marginal** and **parietal placentation**).

axillary: arising from the **axil**.

axis (of an inflorescence): that part of the stem or branch on which the individual flowers are borne.

B

baccate: berry-like.

baculate (of pollen grains): covered with rods that are higher than wide and not constricted at their base.

barbate: bearded.

barbed: with rigid points or lateral bristles pointing backwards.

barbellate: shortly **barbed**.

basal: at the base.

basifixed: fixed by its base, e.g. of an anther (compare **dorsifixed**, **medifixed**, **versatile**).

basiscopic: toward the **basal** or **proximal** (as opposed to **distal**) end; facing basally.

B-chromosomes (accessory chromosomes): supernumery chromosomes occurring in addition to the normal **diploid** complement.

beak: a prominent terminal projection, especially of a **carpel** or fruit; a slight narrowing of the **lemma** below the **awns**, as distinct from a longer straight **column**, e.g. in *Aristida* (Poaceae).

bearded: with long awns or with tufts of stiff hairs.
berry: a juicy fruit with soft **pericarp**, the seeds immersed in pulp (compare **drupe**, **pyrene**).
bi- (*prefix*): twice; two; having two.
bicallose: with two **callosities**.
bicarpellate (of an ovary): with two carpels.
bicolorous: two-coloured.
bifacial (of a leaf): **dorsiventral**, having a distinct upper and lower surface.
bifarious(ly): see **distichous**.
bifid: cleft into two parts for ± half the length.
bifoliate: having two leaves.
bifoliolate: having two **leaflets**.
bilabiate: 2-lipped, as when two or three lobes of a calyx or corolla stand separate as an upper lip from the others forming a lower lip.
bilocular: with two **locules** or compartments.
binate: in pairs.
bipinnate: when the primary divisions (pinnae) of a **pinnate** leaf are themselves pinnate.
biramous: with two branches.
biseriate: arranged in two rows or **whorls**.
bisexual: having both sexes in the same **flower** or **inflorescence**.
bitegmic: of an ovule having two **integuments**.
biternate (of a leaf): with two orders of leaflets, each **ternately** compound.
bithecate (of an anther): with two **thecae**.
bivalved: having two **valves**.
blade: the expanded part of a leaf or petal (see also **lamina**, **limb**).
bostrychoid: having the form of a **bostryx**
bostryx (helicoid cyme): a spiiral inflorescence, with axes on different planes, branching always in the same direction.
bothrospermous (of seeds): pitted.
botryoid: like a cluster of grapes.
brachyblast: a **spur shoot** or short branch.
bract: a leaf-like structure, different in form from the foliage leaves and without an axillary bud, associated with an **inflorescence** or a **flower**.
bracteal cup: cup-shaped structure formed by fused bracts (e.g. in Viscaceae).
bracteate: possessing or bearing **bracts**.
bracteole (*adj.* **bracteolate**): small bract borne on the **pedicel** or **calyx** of a flower.
bractiform: looking like a **bract**.
bristle: a stiff, strong **trichome**, similar to a pig's bristle, as in the **perianth** of some Cyperaceae.
brochidodromous (of a leaf): with a single primary vein, the secondary veins not terminating at the margin but joined together in a series of prominent upward arches or marginal loops on each side of the primary vein.
bud: an undeveloped shoot that can give rise to a branch or flower.
bulb: a storage organ, usually underground, made up of a usually much abbreviated stem and fleshy leaf bases.
bulbil: a small deciduous **bulb** (or **tuber**) formed around the mother bulb or in the **axil** of a leaf, and functioning to propagate the plant vegetatively.
bulbous-based: with an inflated base.
bullate: having a blistered or puckered surface; (of a leaf surface): prominently raised, like a bubble, between the veins.
burr: a rough or prickly **propagule** consisting of a seed or fruit and associated floral parts or bracts.
buttress: a flange of tissue protruding from the base of the main trunk of a tree.

C

caducous: falling off early.
caespitose: growing in tufts.
calcarate: having a spur.
calceiform: shaped like a slipper.
callose/callous: hard and thick in texture; bearing **callosities**.
callosity: a leathery or hard thickening of part of an organ.
callus (*pl.* **calli**): a thickened part, such as the thickened extension at the base of the **lemma** at the point of its attachment to the **rachilla**.
calycine: belonging to the **calyx**.
calyculus (*pl.* **calyculi**; *adj.* **calyculate**): the bracts around the **calyx** or an **involucre** resembling an outer calyx (see also **epicalyx**).
calyx (*pl.* **calyces**): the outer envelope of the flower, consisting of free or united **sepals**.
calyx tube: when the **sepals** are partly united, the lower portion is referred to as the tube and the upper free part as the **limb** usually divided into calyx teeth, lobes or segments (see also **hypanthium**).
campanulate: bell-shaped.
campylotropous: of an **ovule** orientated transversely (i.e. with its axis at right angles to its stalk and with a curved **embryo sac**).
canaliculate: channelled.
canescent: ± grey-pubescent or hoary.
cano- (*prefix*): greyish white (usually applied to hair covering).
capillary: resembling a hair; very slender.
capitate: (1) like the head of a pin, as the **stigma** of some flowers; (2) collected into compact head-like clusters, as the inflorescences of Asteraceae.
capituliform: shaped like a **capitulum**.
capitulum (*pl.* **capitula**): a dense head-like inflorescence usually of sessile flowers (see also **head**).
capsule: a dry fruit composed of two or more united **carpels** and either splitting when ripe into flaps called **valves** or opening by slits or pores.
carina (*adj.* **carinal**): a keel; the two partially united **anterior** (lowest) petals of a **papilionaccous** flower, or the single, similar-shaped, anterior petal in many Polygalaceae.
carinate: keeled.
carnose: fleshy.
carpel: an organ (generally believed to be a modified foliar unit) at the centre of a flower, bearing one or more **ovules** and having its margins fused together or fused with other carpels to enclose the ovule(s) in an **ovary**, and consisting also of a **stigma** and usually a **style** (see also **suture**).
carpellate: possessing **carpels**.
carpophore: the stalk of a **carpel** or of a **mericarp**.
carrier: see **corpuscle**.
carpopodium: the stalk of a fruit.
cartilaginous: hard and tough, as the skin of an apple-pip.
caruncle (*adj.* **caruncular/carunculate**): an outgrowth from **integuments** at or near the **hilum** of certain seeds (see also **strophiole**).
caryopsis: a 1-seeded, dry, indehiscent fruit with the seedcoat adnate to the fruit wall, derived from a 1-loculed **superior ovary** (characteristic of Poaceae) (compare **achene**).
castaneous: chestnut-coloured; dark brown.
cataphyll: small scale leaf, e.g. on **rhizomes** of flowering plants.
catkin: a dense, often pendulous **spike** of small unisexual flowers which have no conspicuous **perianth**.
caudate: abruptly ending in a long tail-like tip or appendage.
caudex: a short, thickened, often woody, vertical or branched perennial stem, usually subterranean or at ground level (e.g. in some

spp. of *Encephalartos*—Zamiaceae).

caudicle: the stalk of a **pollen mass** connecting it to the **corpuscle**, in Asclepiadaceae and Orchidaceae (also known as **translator arm**).

caulescent: with an obvious leafy stem; having an evident stem above ground.

cauliflorous: producing flowers from old wood (compare **ramiflorous**).

cauline: arising from or inserted on the stem.

centric (of a leaf): filiform to cylindrical with a ± continuous palisade layer (see also **unifacial**).

centripetal: as in **inflorescences**, blooming from the outside inward or from the base upward.

chalaza (*adj.***chalazal**): basal region of the **ovule** where it joins the **funicle**; region of a seed opposite the **micropyle**.

chamaephyte: a perennial plant, generally woody or partly woody, with the mean height of the renewal buds less than or equal to 0.7 m from the ground.

chartaceous: papery in texture, opaque and thin.

chasmogamous: pollinated when the flower is open (compare **cleistogamous**).

chasmophyte: plant growing in rock crevices.

chlorenchyma: **parenchyma** cells containing chloroplasts.

choripetalous: having separate and distinct petals (= **polypetalous**) (compare **gamopetalous**, **sympetalous**).

cilia (*sing.* **cilium**): short epidermal outgrowths, such as hairs or scales ± confined to the margins of an organ.

ciliate: with a fringe of hairs along the edge.

ciliolate: minutely **ciliate**.

cincinnus (*pl.* **cincinni**; *adj.* **cincinnate**): a tight, unilateral **scorpioid cyme**.

circinnate: spirally coiled, with the tip innermost, as the leaves of *Drosera*—Droseraceae.

circumscissile: applied to an organ opening as if cut circularly around the upper part, which then comes off like a lid.

cirrhiferous: producing **tendrils**.

cirrhose: having **tendrils**.

cistolith: see **cystolith**.

cladode: a flattened, foliaceous stem having the form and function of a leaf, but arising in the axil of a minute, bract-like caducous, true leaf (compare **phyllode**).

clathrate: latticed or pierced with apertures like a trellis.

clavate: club-shaped or thickened towards the end.

clavellate: diminutive of **clavate**, thickened towards the apex.

claviform: club-shaped.

clavuncula/clavuncle: the large, variously shaped stigma of certain members of Apocynaceae.

claw (*adj.* **clawed**): the narrow base of a petal, sepal or bract.

cleistogamous: (of pollination) occurring when the flower is closed (as in *Viola*—Violaceae) (compare **chasmogamous**).

cleft: incised almost to the midrib or base.

club-shaped: gradually thickened from a slender base.

coalesce: to fuse.

cobwebby: entangled with fine filaments (see also **arachnoid**).

coccus (*pl.* **cocci**; *adj.* **coccous**): a one-carpel unit of a **schizocarp** or lobed fruit, becoming separate at maturity (e.g. in Euphorbiaceae).

collateral: standing side by side.

colleter: a mucilaginous secretory hair, often occurring in tufts near the base of the leaf **lamina** and on the **calyx** (e.g. in Apocynaceae).

colliculate: covered with little rounded elevations.

colpate (of a pollen grain): having elongate, longitudinal apertures.

colporate (of a pollen grain): having compound apertures (*adj.*of **colporus**).

colporus (of a pollen grain): a compound aperture consisting of an ectocolpus with one or more endoapertures.

colpus (*pl.* **colpi**) (of a pollen grain): a usually longitudinal, ± distinct aperture (compare **sulcus**).

column: (1) the adnate **stamen** and **style** forming a solid central body, as in orchids; (2) the tube of connate **filaments**, as in Malvaceae; (3) a straight structure between the apex of the **lemma** and the branching point of the **awns**, as in *Aristida* and *Stipagrostis* (Poaceae) (see **beak**).

coma: a tuft of hairs at the end of some seeds; a terminal crown of leaves or bracts, e.g. in *Eucomis* (Hyacinthaceae).

commissural: of a joint or seam, such as that between two adhering **sepals**.

commissure: the faces of cohering **carpels** (e.g. in Apiaceae); the place of joining or meeting.

comose: bearing a tuft of **trichomes**, usually apically.

complanate: flattened; compressed.

complicate: folded on itself.

compound: the opposite of **simple**; composed of several similar parts, as a leaf of several leaflets; **compound fruit**: the fruits of separate flowers becoming united into a mass; **compound umbel**: each **ray** again bearing an **umbel**.

compressed: flattened lengthwise from side to side or from front to back.

concolor/concolorous: of uniform colour (e.g. upper and lower leaf surface with the same colour) (compare **discolorous**).

concrescent: growing/grown together.

conduplicate: folded together lengthwise.

condyle: an intrusion of the placenta which forms grooves or cavities in the **endocarp** of the developing fruit (e.g. in Menispermaceae).

confervoid: composed of threads; (of **pollen**): united in strings.

conflorescence: a modified, condensed inflorescence, as found in *Eucalyptus*—Myrtaceae.

connate: applied to parts of the same series which are united so closely that they cannot be separated without tearing.

connective: the part of an anther which connects its two **thecae**.

connivent: applied to parts converging so as to be nearer together above than below.

conoidal: ± conical.

conservation (of a name): the decision of an International Botanical Congress that a validly published name shall be used even though to do so is contrary to the International Code of Botanical Nomenclature (**I.C.B.N.**).

contorted (of **sepals** and **petals**): twisted in the bud so that each overlaps the adjoining one on one side and is overlapped by the other adjoining one on the other side, like a furled umbrella; spirally twisted.

contractile roots: a specialised type of root, often found in bulbous plants, that undergoes contraction and thereby pulls the bulb or shoot parts deeper into the soil.

convexity: the condition of being convex or having a curvature that bulges towards the point of observation.

convolute: rolled up lengthwise (also used in the sense of **contorted**).

cordate: applied to the base of a leaf when it is ± deeply notched.

coriaceous: firm, tough, of the consistence of leather.

corm: a tuberous bulb-like **rootstock**.

cormous: possessing a **corm**.

cornate: bearing a horn.

corniculate: bearing or terminating in a small horn-like protuberance or process.
cornute: bearing a horn.
corolla: the inner envelope of the flower, consisting of free or united **petals**.
corona: a crown; (in the flower of some Apocynaceae and Passifloraceae and others): a circle of appendages between the **corolla** and **stamens**, often united in a ring or crown; in some members of the Asclepiadoideae—Apocynaceae the corona consists of one or two (sometimes three) alternating rows different in size and shape, the outer row nearest to the corolla lobes, the inner row nearest to the **staminal column**.
coroniform: shaped like a crown.
corpuscle/corpusculum (*pl.* **corpuscula**): a small, ± spherical, slightly 2-parted, hard, usually brown to black, sticky body with two flexible arms (**caudicles**), each carrying one **pollinium**, in Asclepiadoideae—Apocynaceae.
cortex: the unspecialised tissue in stems and roots between the vascular bundles and the epidermis.
corymb (*adj.* **corymbose**): a ± flat-topped **racemose inflorescence** in which the branches or **pedicels** start from different points but all reach to about the same level.
costa (*pl.* **costae**): the midvein of a single leaf or the **rachis** of a **pinnately compound** leaf.
costule: the midrib of a **pinnule** or **pinna** segment.
cotyledon: the primary leaf of an **embryo**.
craspedodromous venation: leaf venation characterised by a single primary **vein**, with the lateral veins terminating at the margin.
crassate: coarse, gross, dense, thick.
crenate (*noun* **crenation**) (of a margin): notched with regular blunt or rounded teeth; scalloped.
crenulate: crenate with very small teeth; minutely scalloped.
crescentic/crescentiform: biconcave, resembling the shape of the moon in its first or last quarters.
crested: having a crest, elevated appendage or ridge on the summit of an organ.
crinite: bearded with long, weak hairs.
crispate: curled.
crista (*adj.* **cristate**): a crest or ridge.
cruciform: cross-shaped.
crustaceous: of brittle texture.
cucullate: hooded or hood-shaped.
culm: the stem of Cyperaceae and Poaceae.
cultrate/cultriform: shaped like a knife blade.
cuneate (of the base of a leaf): tapering gradually, i.e. wedge-shaped.
cuneiform: wedge-shaped; triangular, with the narrow part at the point of attachment.
cupule/cupulum (*pl.* **cupula**): a cup-shaped structure at the base of some fruits formed by the fusion of **involucral bracts** at their bases, e.g. the acorn of oaks, a structure at the base of the fruits of some palms, the cup-shaped involucre of some Asteraceae; a series of free **trichomes** apically on **achenes** of Asteraceae which become fused with age.
cupular/cupuliform: applied to a shallow, open structure, as the **involucre** of an acorn.
cusp: an abrupt, sharp, often rigid point.
cuspidate: abruptly tipped with a sharp rigid point.
cuticle: a noncellular layer of waxy or fatty materials on the outer wall of epidermal cells.
cutin (*adj.* **cutinous**): a waxy, waterproof substance that is the main constituent of the plant **cuticle**.
cyathiform: cup-shaped.
cyathium: an **inflorescence** resembling a single flower, composed of unisexual flowers surrounded by **bracts** and often by **glands**, typical of *Euphorbia*—Euphorbiaceae.
cymbiform: boat-shaped.
cyme (*adj.* **cymose**): a **determinate inflorescence** in which each flower, in turn, is formed at the tip of a growing axis, and further flowers are formed on branches arising below it (compare **indeterminate** inflorescence).
cymule: a small **cyme** or portion of one, usually few-flowered.
cypsela (*pl.* **cypselae**): an **achene** derived from a 1-loculed, **inferior** ovary; as in the indehiscent fruits of Asteraceae (compare **achene**).
cystolith: mineral concretion, usually of calcium carbonate, in the epidermis of e.g. Acanthaceae and Urticaceae, showing up as streaks or protuberances, particularly in dried material.

D

deciduous: falling off at the end of the season of growth (compare **evergreen**).
declinate: angled downwards or forwards (eompare **decurved**).
decompound: applied to leaves that are several times divided or **compound**.
decrescent: decreasing, gradually growing less.
decumbent: spreading horizontally at first but then growing upwards.
decurrent: as when the edges of the leaf are continued down the stem or petiole as raised lines or narrow wings.
decurved: angled downwards and curved or curled.
decussate: in opposite pairs, with each pair at right angles to the one above and below it.
deflexed: bent abruptly downwards or outwards (compare **inflexed**).
dehiscent/dehiscing (*noun* **dehiscence**): opening spontaneously when ripe as in **capsules** and **anthers**.
deliquescent: dissolving or melting away.
deltate: shaped like an equal-sided triangle.
deltoid: shaped ± like an equal-sided triangle.
dendritic/dendroid: tree-like; resembling the shape of a tree; having a branched appearanee.
dentate (of a margin): prominently toothed, the teeth directed outwards.
denticulate: finely toothed/**dentate**.
depressed: ± flattened from above downwards or at least at the top.
determinate (of an **inflorescence**): with a **bud** or **flower** terminating the growth of the main axis (compare **indeterminate**).
dextrorse: turned toward the right (compare **sinistrorse**).
di- (*prefix*): two-.
diad (of a pollen grain): two fused together (compare **monad**, **tetrad**).
diadelphous: having the **stamens** united into two groups, or all but one united in a group and one free (e.g. many Fabaceae) (compare **monadelphous**).
diadem: a crown.
diaphanous: very thin and transparent.
dichasium (*adj.***dichasial**): a **determinate** type of **cymose** inflorescence having a central, older flower which develops first and a pair of opposite lateral branches bearing younger flowers (compare **monochasium**).
dichlamydeous: said of a flower having two whorls of **perianth** parts.
dichotomous: forking regularly into two equal branches.
dicotyledon: a flowering plant having two **cotyledons** in the seed (compare **monocotyledon**).

dictyostelic: with vascular bundles concentrically arranged with large overlapping **leaf gaps**, in the trunk.
didymous: 2-lobed; (of **anthers**): distinctly 2-lobed but with almost no connective.
didynamous (of **stamens**): with four in two pairs of unequal length, e.g. in Acanthaceae and Lamiaceae.
diffuse: loosely and openly branching or spreading.
digitate: like the fingers of a hand, with the members arising from the same point.
digitiform: shaped like a finger.
dimidiate: having one of two sides or parts more developed than the other.
dimorphic/dimorphous: of two forms.
dioecious: with unisexual flowers, the male and the female flowers on separate plants (compare **monoecious**).
diploid: having two of the basic sets of chromosomes in the nucleus (compare **haploid**).
disarticulate: breaking apart at the joints.
disc: (1) an enlargement of the **receptacle** within the calyx or within the corolla or stamens, usually in the form of a ring, cup or cushion, often lobed or even cut up into so-called (nectary) **glands**; (2) **disc floret**: the central florets as compared with the **ray florets** in a head of the Asteraceae.
disciform (of heads of Asteraceae): with central flowers perfect with tubular **corollas**, and the marginal flowers **pistillate** or neuter but without **ligules**, their corollas tubular or wanting.
discoid: (1) like a disc or plate; (2) applied to the heads of Asteraceae without **ray** flowers.
discolorous: of a leaf in which the two surfaces are unlike in colour (compare **concolorous**).
dissepiment: a partition (**septum**) within an ovary or fruit, derived from fusion of adjacent **carpels**.
distal: farther from the point of attachment or origin (compare **proximal**).
distichous: regularly arranged one above the other in two opposite rows, one on each side of the stem or **rachis**.
diurnal: happening during the day.
divaricate: widely divergent or spreading in different directions, and often ± horizontal.
dizonasulculate (of a pollen grain): with two ring-like **sulci** around the equator.
domatium (*pl.* **domatia**): small swelling/pocket on the lower surface of the leaf of some woody dicotyledons in the axils of the primary veins, usually partly enclosed by leaf tissue or hairs.
dorsal: relating to or situated on the face turned away from the axis; (of a leaf): the lower surface; (of a thallus): the upper surface, facing away from the substrate (compare **ventral**).
dorsifixed: attached at or by its back, said e.g. of an **anther** to the **filament**.
dorsiventral: flattened and having distinct **dorsal** and **ventral** surfaces, the two usually different, as in many leaves.
drupe (*adj.* **drupaceous**): an indehiscent, fleshy fruit, usually 1-seeded, in which the **pericarp** is clearly tripartite: a tough **exocarp**, a fleshy **mesocarp** and a hard **pericarp**, found e.g. in plum or cherry, in *Flacourtia* and *Ximenia* and in the **aggregate 'fruit'** of e.g. *Rubus* (Rosaceae); **drupaceous** often refers to a fruit that is drupe-like but not strictly a drupe (compare **berry**, **pyrene**).
drupelet: a small **drupe**.
druse: an aggregate of crystals within a cavity.
duplicate: folded twice.

E

e- (*prefix*): often implying absence of something, e.g. in **ebracteate**, **eglandular**.
ebracteate: without **bracts**.
ecalcarate: without a spur.
ecallose: without **callus/calli**.
ecalyculate: without a **calyculus**.
ecaudate: without a tail-like tip or appendage.
echinate: covered with **prickles** like a hedgehog.
echinolophate (of a pollen grain): **lophate** with **echinate** ridges.
echinulate: covered with small, pointed **spines**.
effuse: spreading out loosely, especially of an inflorescence.
efoliate: without leaves.
eglandular: having no glands.
elaiosome: an appendage of a seed, usually rich in oil, attractive to animals (especially ants) and hence an aid to dispersal by such animals.
eligulate: without a **ligule**.
ellipsoid: an elliptic solid.
elliptic: in the form of a flattened circle more than twice as long as broad.
emarginate: notched at the extremity.
embryo: the rudimentary plant still enclosed in the seed, consisting of the **radicle** from which the root develops, the **cotyledons** (one, two, rarely more), which become the earliest leaves, and the **plumule**, the bud from which the stem and further leaves develop.
emergent/emersed: with part of the plant aerial and the rest submersed; with part extending out of the water.
endemic: having a natural distribution confined to a particular geographical region.
endocarp (*adj.* **endocarpal**): the innermost layer of the wall of a fruit.
endosperm: formerly called **albumen**, the nutritive material (mealy, oily, fleshy or horny), formed in the embryo sac after fertilisation and stored within the seed and often surrounding the embryo (compare **perisperm**).
endothecium (*adj.* **endothecial**): the inner lining of the **theca** of an **anther**.
enervate: without **nerves**.
ensiform: sword-shaped.
entire: with an even margin without teeth, lobes, etc.
entomophilous (of pollination): effected by insects (compare **anemophilous**, **hydrophilous**, **ornithophilous**).
epaleate: without **paleae**.
epapillate: without **papillae**.
epappose: without a **pappus**.
epi- (*prefix*): on, upon, above, over.
epicalyx: an **involucre** of **bracts** arising below the flower, resembling an extra **calyx**, as in some Malvaceae (see also **calyculus**).
epicarp: the outer layer of the wall of a fruit (see also **pericarp**).
epichile (of an orchid flower): apical portion of a longitudinally two- or three-partite **lip**.
epidermis (*adj.* **epidermal**): the outermost layer of cells of an organ, usually only one cell thick.
epigeal: describing seed germination in which the **cotyledons** emerge from the seed and are elevated above the soil surface (compare **hypogeal**).
epigynous: applied to the flower when the sepals, petals and stamens are apparently borne above the ovary, the latter being en-

closed in an adnate **receptacle** or **calyx tube** (compare **hypogynous**, **perigynous**).

epilithic: living on rocks (= **lithophytic**).

epipetalous: borne on the **petals**.

epiphyte (*adj.* **epiphytic**): a plant that grows on another plant but without deriving nourishment from it, i.e. not parasitic, as some ferns and orchids growing on trees.

episepal: an **epicalyx** segment.

episepalous (of **stamens**): borne on the **sepals**.

epitropous/epitropic (of an **anatropous** ovule): with its **raphe** facing the **placenta** when **pendulous**, facing away from it when **ascending**.

equitant (*literally* riding, astride); (of leaves): folded sharply in half along the midline so that the adaxial surface is hidden and the margins overlap both margins of a similarly folded leaf on the opposite side of the stem, thus creating a 2-ranked arrangement typically found in Iridaceae (compare **obvolute**).

ericoid: resembling plants of the family Ericaceae, especially their small, tough leaves.

erose: applied to a margin which is irregularly eroded, gnawed or jagged.

estipitate: having no **stipe**.

estrophiolate: having no **strophiole**.

evagination: something that is inside out.

evanescent: disappearing quickly.

ex- (*prefix*): often implying absence of something, e.g. **exstipulate**.

exalbuminous: without **albumen/endosperm**.

exannulate: without an **annulus** or other ring-like structure.

excrescence: an outgrowth or protuberance, e.g. on the stem of a tree.

excurrent: extending beyond the apex or margin of a leaf into a mucro or awn.

exfoliate: peeling off in layers or shreds.

eximbricate: not **imbricate**.

exine: outer wall of spores and **pollen** grains, usually divided into different layers.

exocarp: the outer layer of the **pericarp**.

exserted: projecting beyond, as the stamens from the tube of the corolla (compare **included**).

exstipulate: without **stipules**.

extra-axillary: beyond or outside the **axil**.

extra-floral (of nectaries): not within the flower.

extrastaminal (e.g. of the **corona**): outside the **stamen** whorl.

extrorse: of an **anther** which opens outwardly towards the circumference of the flower (compare **introrse**).

F

facultative (of **parasites**): optional (compare **obligate**).

falcate: curved like a scythe.

family: a group of one to many genera believed to be related phylogenetically, usually clearly separable from other such groups; the major taxonomic group between genus and order.

farinose: covered with mealy powder resembling flour.

fascicle (*adj.* **fascicled/fasciculate**): a cluster of flowers, leaves, etc. arising at about the same point.

fastigiate: strictly erect and ± parallel to other members, e.g. with reference to stems or branches.

faucal: of the throat of a **gamopetalous** corolla.

fenestrate: having openings or translucent areas ('windows').

ferrugin(e)ous: rust-coloured.

fetid: see **foetid**.

fibril: submicroscopic thread or fibre that constitutes the form in which cellulose occurs in the cell wall.

fibrillose: covered with small fibres.

-fid (*suffix*): indicating number of parts into which an organ is cleft (divided up to ± the middle).

filament: the stalk of a **stamen** supporting the **anther**; a thin thread.

filamentous: thread-like.

filiform: slender, thread-like.

fimbriate: with the margin bordered by long, slender, hair-like processes.

fimbrillate/fimbrilliferous: minutely **fimbriate**.

fistular: hollow throughout its length, like a pipe but closed at the ends.

flabellate: fan-like.

flaccid: weak, limp, lax or flabby, tending to wilt (compare **turgid**).

flag leaf: the first leaf below the inflorescence.

flexuose/flexuous: zigzag or bent alternately in opposite directions.

floccose: covered with woolly hairs which tend to rub off and adhere in small masses.

floral: belonging to or associated with a flower.

florescence: **inflorescence** with a cluster of flowers terminating the main axis, but not terminating with a flower and hence apex of florescence remaining **indeterminate** forming exclusively lateral flowers.

floret: small individual flowers that make up a (dense) inflorescence, as those in the **heads** of Asteraceae or the **spikelets** of Poaceae.

floricane: a flowering and fruiting stem, especially of brambles (*Rubus* spp.—Rosaceae).

flower: the sexual reproductive structure of angiosperms, typically consisting of **gynoecium**, **androecium** and **perianth** and the **axis/receptacle** bearing these parts.

foetid/fetid: having a disagreeable odour.

foliaceous: leaf-like.

foliar: of or relating to a leaf.

foliolate: having **leaflets**.

follicle (*adj.* **follicular**): a fruit formed from a single **carpel** opening usually only along the inner (i.e. ventral) **suture** to which the seeds are attached.

forb: a non-woody plant other than a grass, sedge, rush, etc. (compare **herb**).

-form (*suffix*): superficially resembling; e.g. an umbelliform inflorescence is one that resembles, but is not a true **umbel**.

fornix (*pl.* **fornices**): a small scale.

foveate: pitted.

foveolate: marked with small pitting.

free: neither adhering nor united; **free-basal placenta**: one in which the ovules are attached to a central column arising from the base of the ovary cavity and not reaching the top, e.g. in Primulaceae; **free-central placenta**: the same but reaching to the top of the cavity, e.g. in most Caryophyllaceae.

frond: leaf of a fern, palm or cycad, or the **thallus** of e.g. Lemnaceae.

frondose: leafy.

frutescent: becoming shrub-like (woody).

fruticose: shrub-like.

fugaceous: lasting only for a short time.

fugitive: moving from place to place; evanescent, quickly fading or perishable, volatile.

fulvous: tawny.

funicle/funiculus: the stalk which attaches the **ovule** to the **placenta**.

funnelform: funnel-shaped, gradually widening upwards.

furcate: forked.

fuscous: of a brownish grey colour.
fusiform: spindle-shaped, thick but tapering towards each end.

G

galea: a **petal** shaped like a helmet; the strongly concave upper lip (petal) of some **bilabiate** corollas.
galeate: helmet-shaped; having a **galea**.
gamete: a **haploid** cell or nucleus that fuses with another, of opposite sex, in sexual reproduction.
gametophyte: a plant, or phase of a plant's life cycle, that bears **gametes**.
gamopetalous: with the **petals** united, either entirely or at the base into a tube, cup or ring (see also **choripetalous**, **sympetalous**; compare **polypetalous**).
gamosepalous: with united **sepals**.
gamotepalous: with united **tepals**.
gasteriform: shaped like a belly; (of a perianth tube, e.g. in *Gasteria*—Asphodelaceae): basally inflated.
gemma (*pl.* **gemmae**): an **adventitious bud** capable of reproducing the plant; a process found on pollen grains.
gemmiferous: bearing **gemmae**.
geniculate: bent like a knee.
genome: a complete **haploid** set of chromosomes, as present in a **gamete**.
genotype: the total complement of hereditary factors (genes) acquired by an organism from its parents and available for transmission to its offspring (compare **phenotype**).
genus (*pl.* **genera**): a group of species believed to be related phylogenetically and usually clearly separable from other such groups, or a single species without close relatives; the major taxonomic rank between species and family.
geocarpic/geocarpous: referring to the development of fruits in the ground originating from flowers which developed and were pollinated above ground.
geophyte: a perennial plant, usually herbaceous, with renewal buds located on the plant below the soil surface, as on **bulbs** or **rhizomes**.
geoxylic: of a woody plant with numerous stems arising from a subterranean **rhizome**.
gibbosity (usually of a **calyx** or **corolla**): a pouch-like swelling or hump.
gibbous: with a **gibbosity**.
glabrate: glabrous, but obviously having previously had an **indumentum**.
glabrescent: becoming **glabrous** or nearly so.
glabrous: devoid of hairs.
gland (*adj.* **glandular/glandulose**): (1) secreting structure on the surface or embedded in the substance of a leaf, flower, etc., or raised on a stalk (glandular hairs or stipitate glands); (2) a warty protuberance or fleshy excrescence (often on petiole, inflorescence, or within the flower); (3) (see **corpuscle**).
glaucous: pale bluish green or with a pale bloom.
globose: ± spherical or rounded.
glochid/glochidium (*pl.* **glochidia**; *adj.* **glochidiate**): barbed bristle or hooked hair.
glomerate: compactly clustered.
glomerule (*adj.* **glomerulate**): a small compact cluster.
glumaceous: resembling the **glumes** of Poaceae.
glume: a **bract**, usually chaffy, in the **spikelets** of Cyperaceae, Poaceae and similar plants.
glutinous: with a sticky exudate.
granulose/granulate: finely covered with very small granules.
gregarious: growing in groups or colonies.
guide rails: see **gynostegial grooves**.
gymnosperm: a seed plant with the ovules borne on the surface of a **sporophyll** (compare **angiosperm**).
gynobase: a dilation or prolongation of the receptacle which bears **carpels/nutlets** (e.g. in Boraginaceae).
gynobasic (of the **style**): arising apparently from the base of the **gynoecium**, e.g. between the lobes of the ovary, as in Boraginaceae and Lamiaceae.
gynodioecious: having bisexual flowers and female flowers on separate plants (compare **gynomonoecious**).
gynoecium: the female part of the flower, consisting, when complete, of **ovary**, **style** and **stigma**; also called **pistil**.
gynomonoecious: having bisexual and female flowers on the same plant (compare **gynodioecious**).
gynophore: a stalk supporting the **gynoecium** and formed by an elongation of the **receptacle**.
gynostegial corona: collective term for the **staminal** and **interstaminal coronas**, both of which are associated with the **gynostegium**.
gynostegial grooves: the grooves between the lateral margins of adjacent anthers fused to the **style head**, in Apocynaceae (also known as **anther slits**, **anther wings** or **guide rails**) (see also **gynostegium**).
gynostegium (*pl.* **gynostegia**): a structure formed by the union of the **stamens** with part of the **pistil**, as in Apocynaceae.
gynostemium (*pl.* **gynostemia**): the **column** in the centre of flowers of Orchidaceae formed by the union of the stamen with part of the **gynoecium**.

H

habitat: the environment in which a plant lives.
hair type B (in tribe Gnaphalieae—Asteraceae): with one basal cell and a very long terminal cell.
half-inferior (of an **ovary**): partly below and partly above the level of attachment of **perianth** and **stamens**.
halophilous: salt-loving.
halophyte: a plant that grows in very salty soil.
haploid: having a single set of unpaired chromosomes, as in the nucleus of one of the **gametes**.
hapteron (*pl.* **haptera**): flattened organ, without vascular tissue, attaching the **thalli** of Podostemaceae to the substrate by a cement-like substance.
hastate: applied to the base of a leaf when it has two more or less triangular lobes diverging laterally.
hastula (in palms with **palmate** leaves): the outgrowth from the top of the leaf stalk (**rachis**).
haustorium (*pl.***haustoria**): a specialised root of parasitic plants capable of penetrating host tissue and thus absorbing nutrients.
head: a dense **inflorescence** of sessile or nearly sessile flowers on a compound **receptacle** (see also **capitulum**).
helical: shaped like a helix/spiral.
helicoid: coiled; (of a **cymose** inflorescence): branching repeatedly on the same side.
heliophilous: sun-loving.
helophytic: growing in marshes.
herb: any vascular plant that never produces a woody stem (compare **forb**).
herbaceous: not woody; soft in texture.
hermaphrodite (*adj.* **hermaphroditic**): an organism or structure possessing both male and female reproductive organs, e.g. a flower with both stamens and pistil (= **bisexual**).

heteroblastic: having the adult parts of the plant (especially the leaves) distinctly different in form from the juvenile parts.

heterocarpic/heterocarpous: having carpels or fruit of more than one kind.

heterocarpy: having two kinds of fruit.

heterodistylous: said of a species in which two kinds of plants occur, those with long styles and those with short styles.

heterogamous: of different sexes; (of a flowerhead, as in some Asteraceae): having two kinds of **florets**, those of the **ray** florets being neuter or unisexual and those of the **disc** florets bisexual; of **spikelet** pairs in Poaceae: consisting of a sterile and a female-fertile spikelet (compare **homogamous**).

heteromorphic: of different forms (compare **homomorphic**).

heterophyllous: having leaves of different forms.

heterosporous: having two types of **haploid** spores (compare **homosporous**).

heterostylous: applied to a species which has flowers with **styles** differing in length or shape (compare **homostylous**).

heterothetic (of a compound raceme): composed of a terminal as well as lateral racemes.

hilum (*adj.* **hilar**): the scar left on the seed where it was attached to the **funicle** or **placenta**.

hippocrepiform: horseshoe-shaped.

hirsute: with rather coarse, stiff hairs (compare **villous**).

hirsutulous: minutely **hirsute**.

hispid: bristly pubescent.

hispidulous: minutely **hispid**.

hoary: covered with white or greyish white, very short, closely interwoven hairs.

holonectary (e.g. in Mesembryanthemaceae): a nectary forming a continuous ring.

homogamous: applied to a flowerhead/**capitulum** with all the flowers of the same kind; or to spikelet pairs in Poaceae that are of the same sexuality (compare **heterogamous**).

homomorphic/homomorphous: uniform in shape (compare **heteromorphic**).

homonym (in nomenclature): a name spelled exactly like a validly published name for a taxon of the same rank based on a different type.

homosporus: having only one type of **haploid** spore (compare **heterosporous**).

homostylous: species in which the flowers have **stigmas** and **anthers** held at the same level relative to each other on all plants (compare **heterostylous**).

hood (in flowers of Asclepiadoideae—Apocynaceae): a concave segment of the **corona**.

host: an organism on which a **parasite** lives and by which it it nourished (also applied, loosely, to a plant supporting an **epiphyte**).

humifuse: lying or spreading on the ground.

hyaline: almost transparent.

hydathode: a minute pore or specialised structure through which water is discharged from a leaf by guttation; sometimes differentiated as secretory **trichomes**.

hydrophily (*adj.* **hydrophilous**) (of pollination): effected by water.

hydrophyte (*adj.* **hydrophytic**): a plant living in water or in a very moist habitat; an aquatic plant.

hygrochastic: applied to plants in which opening of the fruit and dispersion of the spores or seeds are caused by absorption of water.

hygrophytes (*adj.* **hygrophytic**): marsh plants or plants that need a large supply of moisture for their growth.

hygroscopic: readily absorbing and retaining moisture from the atmosphere, resulting in changes in form or position of certain cells or structures.

hypanthium (*pl.* **hypanthia**): a cup or tube bearing floral parts above the base, and often above the top of the ovary of a flower, e.g. in many Myrtales or Onagraceae (see also **calyx tube**).

hypochile (of an orchid flower): the basal part of a longitudinally two- or three-partite **lip**.

hypocotyl: the part of the stem of an **embryo** or young seedling below the cotyledonary node.

hypocrateriform: see **salverform**.

hypogeal: growing or remaining below ground; describing seed germination in which the **cotyledons** remain below the soil surface (compare **epigeal**).

hypogynium (*pl.* **hypogynia**): portion of the **receptacle** below the ovary, e.g. in Cyperaceae.

hypogynous: having the flower parts attached below the base of the ovary and free from it; flowers with this arrangement have a **superior** ovary (compare **epigynous, perigynous**).

hypsophyll: leaf borne at the upper level of a plant, as with various floral bracts; some possibly have a protective function.

hysteranthous (of leaves): appearing after the flowers (compare **synanthous**).

I

I.C.B.N. = International Code of Botanical Nomenclature.

idioblast: a cell that differs from those around it in the same tissue.

illegitimate (of a validly published name): contrary to one or more articles of the **I.C.B.N.**

imbricate: (1) overlapping like tiles; (2) applied to parts in a flower bud where one **sepal** or **petal** is wholly internal and one wholly external and the others are overlapping at the edge only.

immaculate: without spot or stain; pure, unblemished, undefiled.

immarginate: not **margined** or bordered.

imparipinnate: having an uneven number of **pinnae**, by virtue of having one terminal **pinna**.

imperforate: not perforated.

inaperturate (of a pollen grain): without germinal pores.

incised: margin cut rather deeply and sharply.

included: not projecting (compare **exserted**).

incrassate: thickened.

incumbent: resting or lying (on); (of the orientation of an **embryo**): with the **cotyledons** lying face to face and folded downwards beside the **radicle** (as in some Brassicaceae); (of anthers): lying against the inner face of the **filament**.

incurved: bent or curved inwards or upwards; (of leaf margins): curved towards the **adaxial** surface.

indefinite: variable in number; numerous; many; (of stamens): more than twice as many as the petals or sepals; (of an inflorescence): not terminating in a flower, i.e. having a continuing terminal growing point.

indehiscent: not opening when ripe.

indeterminate: (1) (of an **inflorescence**): the lateral or lower flowers mature first while the primary axis continues to grow, hence the terminal flower is the last to open, therefore a **racemose** inflorescence (compare **cymose**) (2) (of growth): (= **monopodial**) the condition in which the terminal bud persists and produces successive lateral branches.

indumentum: any covering of a surface such as hairs, wool, scales.

induplicate: with margins (of **petals** or **sepals**) folded inwards but not overlapping.

indurated: hardened.

indusium (*pl.* **indusia**): a cup covering the **stigma**, as in

Goodeniaceae.

inferior: beneath or below, as in a **calyx** which is below the **ovary**, the latter then being **superior**; as in an ovary which appears to be below the calyx, the latter being adherent to the ovary.

inflexed: bent sharply inwards, upwards or forwards (compare **deflexed**).

inflorescence: the arrangement of the flowers.

infra- (*prefix*): below; beneath.

infructescence: the arrangement of fruits on a plant.

infundibular/infundibuliform: funnel-shaped.

inrolled: see **involute**.

insectivorous: catching, and presumably feeding on, insects.

inserted: attached, included.

insertion: place of attachment.

integument: one of the outer layers of tissue of an **ovule**.

intercalary (of growth): between apex and base, not apical.

internode: the portion of a stem between two nodes (compare **node**).

interpetiolar: applied to **stipules** placed between the **petioles** of opposite leaves (often **connate**).

intersepalar: between the **sepals**.

interstaminal corona: fleshy lobes, often connate into a tube, attached to the base of the **staminal column** in the interstaminal areas (compare **gynostegial corona**, **staminal corona**).

interstice: space between structures.

interstitial: situated in **interstices** or spaces between structures; interstitial growth: a type of growth occurring in organs that do not have specific or localised **meristematic** regions; all-over growth, as in some fruits.

intrapetiolar: between the **petiole** and the stem (compare **interpetiolar**).

intrastaminal: between the **stamens**.

introduced: not indigenous; not native to the area in which it now occurs (compare **adventive**, **naturalised**).

introflexed: see **inflexed**.

introrse: applied to an **anther** opening towards the centre of the flower.

intruse: projecting or pushed out, in or forward.

invested: covered tightly; the focus is on the tight fit, e.g. an **integument** invests a seed.

involucel: **involucre** of bracteoles surrounding a secondary inflorescence such as the base of an **umbellule**.

involucrate: having an **involucre** of some kind.

involucre/involucrum (*adj.* **involucral**): a number of bracts, e.g. those surrounding the base of a flowerhead/**capitulum** or of an **umbel**.

involute: having the edges of the leaves rolled towards the **adaxial** surface (compare **revolute**).

irregular (of a flower, calyx or corolla): bilaterally symmetrical, symmetrical about one plane only, usually the plane that bisects the flower vertically along the longitudinal axis; (= **zygomorphic**) (compare **actinomorphic**, **regular**).

isobilateral (= **isolateral**) (of a leaf): having structurally similar upper and lower surfaces.

isopolar (of a pollen grain): with the equatorial plane dividing the grain into similar halves, i.e. the proximal and distal faces are similar.

isthmus (*pl.* **isthmi**): a narrow part or organ connecting two larger parts.

J

jugate: coupled or yoked together, applied especially to the **leaflets** of a **pinnate** leaf.

K

keel: (*syn.* **carina**): a ridge like the keel of a boat; in Fabaceae a boat-shaped structure formed by the fusion of the two **anterior petals**.

keeled: ridged along the middle of a flat or convex surface.

kneed: having a knee-like joint.

L

labellum: a **lip** (see there).

lacerate: cut irregularly; appearing torn, as in certain leaves and **ligules**.

lacinia (*pl.* **laciniae**): a slender lobe.

laciniate: cut into slender, pointed lobes.

lacinulate: finely **laciniate**.

lacuna (*pl.* **lacunae**): (1) an internal air space or chamber, usually between cells, as in leaf, stem and root tissues; also any space within a cell; (2) a **leaf gap** as viewed in cross sections of stem nodes.

lacunar: referring to or arising from **lacunae**.

lacunose: full of **lacunae**; having air-cells.

laevigate: see **levigate**.

lageniform: shaped like a Florence flask.

lamella (*pl.* **lamellae**; *adj.* **lamellate**): a thin plate or layer.

lamina (*pl.* **laminae**): the limb, blade or expanded part of a leaf, sepal or petal.

lanate: woolly.

lanceolate: lance-shaped; about four times as long as broad, broadest in the lower half and tapering toward the apex.

lanuginose: cottony, similar to **lanate**, but with shorter **trichomes** (hairs).

latex: a viscous fluid exuded from the cut surfaces of leaves and stems of certain plants.

latiseptate: with broad partitions (compare **angustiseptate**).

latrorse (of **anthers**): opening laterally, i.e. towards adjacent anthers.

leaf gap: gap left in the vascular system at the node of a stem at the point where the vascular element supplying the leaf, branches off.

leaflet: the ultimate member of a **compound** leaf.

legume: a simple fruit, consisting of a single **carpel**, usually dry and usually opening along both **sutures** into two halves, e.g. in the Fabaceae; any member of the Fabaceae.

lemma: the lower of two **bracts** enclosing the florets of Poaceae.

lenticels (*adj.* **lenticellate**): corky spots on the bark through which gaseous exchange occurs.

lenticular: shaped like a biconvex lens.

lepidote: clothed with small, scurfy scales.

levigate: having a smooth, polished surface.

liana/liane: a woody climber with rope-like stems.

ligneous: of or resembling wood.

lignified: woody, due to the deposition of lignin in cell walls.

lignotuber (*adj.* **lignotuberous**): a woody swelling at the base of the shoot system below or just above the ground, containing **adventitious** buds from which new shoots develop if the top of the plant is cut off or burned.

ligulate: strap-shaped, applied e.g. to the **ray** florets in many Asteraceae.

ligule: (1) a thin, membranous and/or hairy appendage at the top of the leaf sheath as in Poaceae; (2) the **limb** of **ray florets** in Asteraceae.

limb: the upper, usually expanded part of the calyx or corolla above the tube, throat or claw.

linear: long and very narrow in relation to the length and with parallel edges (compare **lorate**).

lineolate: marked with fine lines.

lingulate: tongue-shaped.

lip: (1) one of two divisions of a **gamosepalous calyx** or a **gamopetalous corolla** when it is cleft into an upper (posterior) and a lower (anterior) portion (see **bilabiate**); (2) of an orchid: the lowest petal (the inner median perianth lobe), usually enlarged and different in form from the two lateral ones (= **labellum**).

lithophyte (*adj.* **lithophytic**): a plant that grows on rocks (= **epilithic**).

lobe: any division or segment of an organ (usually rounded); specifically a part of a leaf, petal or calyx cut less than halfway to the centre.

lobulate/lobuled: having small lobes.

lobules: small lobes.

locellate: divided into small secondary compartments.

locular: having chambers; thus: **unilocular** = one-chambered; **bilocular** = two-chambered, etc.

locule/loculus: a chamber or cell of an ovary or fruit or anther containing ovules or seeds or pollen grains.

loculicidal: referring to the dehiscence of a fruit which splits down the middle of the cells or **locules** (i.e. the midrib or dorsal suture) and not at the line of junction of the **carpels**, e.g. in most Liliaceae (in wide sense) (compare **septicidal**).

lodicule/lodicula (*pl.* **lodiculae**): a small scale outside the stamens in flowers of the Poaceae.

loment/lomentum: modified **legume** fruit with constrictions between the seeds, which at maturity separates at the constrictions into 1-seeded segments.

lophate (of a pollen grain): with the outer **exine** raised in a pattern of ridges.

lophomorphic: crested.

lorate (*syn.* **loriform**): strap-shaped; moderately long with parallel sides (compare **linear**).

lumen: the cavity of a plant cell.

lunate/luniform: shaped like the waxing moon.

lunulate: finely **lunate**.

lyrate: applied to a leaf which is pinnately lobed or cut into small segments below, but with a much larger terminal lobe.

lysigenous: originating by dissolution of cells.

M

maculate (*noun* **maculation**): spotted or blotched.

mallee: scrub vegetation composed mainly of **Eucalyptus* spp. (Myrtaceae) about 2–10 m high in dry, subtropical parts of southwest and southeast Australia.

mam(m)illate: having small nipple-shaped projections.

marcescent: withering without falling off.

marginal: occurring at or very close to the margin.

marginal placentation: the type of **placentation** found in a **gynoecium** consisting of a single **carpel** or of two or more free carpels and where the margins of the carpel(s) have become united to form a suture along which the ovules are borne (see also **axile** and **parietal placentation**).

marginate/margined: having a margin of distinct colour or texture.

marmorate: marbled, having coloured veins.

medial/median: of or situated in the middle.

medifixed: fixed by the middle, e.g. of an anther (compare **basifixed**, **dorsifixed**, **versatile**); (of a hair): ± T-shaped with the stem much shorter than the cross-bar.

medulla: the pith of a stem.

megaspore: the larger of the two kinds of spores produced in the sexual life cycle of a **heterosporous** plant, giving rise to the female **gametophyte**.

membranaceous/membranous: of thin, translucent texture.

mentum: an extension of the base of the **column** in the flower of some Orchidaceae.

mericarp: one segment of a fruit that breaks at maturity into units derived from the individual carpels, e.g. in Apiaceae or Malvaceae (see also **schizocarp**).

meridional: running in a north-south direction, from apex to base.

meristem (*adj.* **meristematic**): growing region of a plant in which cells which have retained their embryonic characteristics, or have reverted to them secondarily, divide to produce new cells.

-merous (*suffix*): indicating number of parts, e.g. flowers 5-merous where floral organs are present in 5s.

mesocarp: the fleshy portion of the wall of a succulent fruit inside the skin and outside the stony layer, if any, surrounding the seed(s) (see also **pericarp**).

mesochile (of flowers of certain Orchidaceae): the middle portion of a longitudinally two- or three-partite **lip**.

mesomorphic: having characteristics suited to growing in environments that are neither very dry nor very wet.

mesophyll: photosynthetic tissue of a green plant.

mesophyte (*adj.* **mesophytic**): plants which grow in environments that are neither very wet nor very dry; plants intermediate in moisture requirements between **hydrophytes** and **xerophytes**.

micropyle: a minute canal through the **integument(s)** of an ovule through which the pollen tube enters and which persists as a pore in the seed coat.

microsporangium (*pl.* **microsporangia**) (in an **anther**): the chamber in which the pollen is formed (= **pollen sac**) (see **anther**).

microspore: the smaller of the two kinds of spores produced in the sexual life cycle of a **heterosporous** plant, giving rise to the male **gametophyte**.

midrib: the principal, usually central nerve of a leaf or leaf-like part.

mitre-shaped/mitriform: shaped like a bishop's cap.

monad (of pollen grains): single, not fused to others (compare **diad**, **tetrad**).

monadelphous (of stamens): in one bundle, e.g. in certain Fabaceae and Malvaceae.

moniliform: like a string of beads.

mono- (*prefix*): one; single.

monocarpic: applied to a plant which flowers and fruits only once and then dies (compare **polycarpic**).

monochasium (*pl.* **monochasia**; *adj.* **monochasial**): a **cyme** reduced to single flowers on each axis (the laterals of the **dichasium** having been lost by reduction).

monochlamydeous: with a perianth of a single **whorl** of similar parts (**tepals**).

monocotyledon: a flowering plant having a single **cotyledon** in the seed (compare **dicotyledon**).

monoecious: with male and female flowers separate but borne on the same individual plant.

monolete: with the dehiscence line unbranched, as in bilateral spores.

monomerous: formed of a single member.

monomorphic/monomorphous: of one form only.

monophyletic: derived from a single ancestral line (compare **polyphyletic**).

monopodial (of growth): with a persistent terminal growing point producing many lateral organs successively (compare **sympodial**).

monosulcate (of a pollen grain): having a single longitudinal groove

or **sulcus**.

monothecous (of an anther): having one **theca**.

monovalent/univalent: a single, unpaired chromosome during meiosis.

morchelliform: shaped like a morel (a fungus of the genus *Morchella* which has a pitted cap).

mucilage (*adj.* **mucilaginous**): a gelatinous substance which absorbs water and increases in bulk.

mucous: slimy.

mucronate: ending abruptly in a short stiff point which is a continuation of the midrib.

mucronulate: finely **mucronate**.

multifid: divided into many lobes or segments.

muricate: rough, with short hard tubercles or pointed protuberances.

muriculate: finely **muricate**.

muticous: blunt, without a point.

mycorrhiza: a symbiotic union between a fungus and a plant root.

mycotrophic: of a plant possessing mycorrhiza.

myxogenic: capable of forming mucus (when wetted).

N

naked (of seeds): exposed on the surface of a sporophyll (not enclosed within an ovary); (of flowers): without perianth.

-nate (*suffix*): indicating number of parts in a group, e.g. leaves 3-nate = three leaves in a group or cluster.

naturalised: introduced and reproducing itself without human assistance (compare **adventive**, **introduced**).

navicular /naviculate/naviculiform: boat-shaped.

nectar guides: floral orientation cues directing a pollinator to the nectar.

nectary/nectarium (*adj.* **nectariferous**): any structure that secretes nectar.

nerves: the principal or more conspicuous **veins** or ribs of a leaf or other organ.

net-veined: with the smaller veins connected like meshes of a net; reticulate.

nigropunctate: with black dots.

nitid: glossy, lustrous, smooth and clear.

nitrophilous: of a plant that grows well in soil rich in nitrogen.

node: the point on the stem at which a leaf or leaves and accompanying organs arise (compare **internode**).

nodose: having knots or being knobby, usually in reference to roots, especially in the legumes (Fabaceae).

nucellus: the female sporangium (megasporangium) within the ovule.

nut: a one-seeded indehiscent fruit, with a hard, dry **pericarp** (the shell).

nutlet: a little **nut**.

O

ob- (*prefix*): inverse or inversely, e.g. **obovate** = inversely **ovate**.

obconic: inversely **conical**, with the point of attachment at the small end.

obcordate: more or less heart-shaped but with the narrow end below, and the broad end deeply notched.

obdiplostemonous (of a flower): with the stamens in two alternating whorls, the outer whorl opposite the petals and the inner opposite the sepals.

oblanceolate: inversely **lanceolate**; with the broadest portion nearest the apex and tapering toward the base.

oblate: transversely broadly **elliptic**.

obligate (of parasites): unable to survive without the **host** (compare **facultative**).

oblique: of unequal sides, e.g. applied to a leaf with the two sides of the blade unequal at the base.

obloid: a solid, near **elliptic** shape depressed at the poles.

oblong: much longer than broad, with nearly parallel sides.

obovate: **ovate** with the broadest part above.

obovoid: solid shape of **obovate** outline.

obsolete: reduced to a rudiment, or completely lacking (compare **rudimentary**, **vestigial**).

obtrullate: inversely **trullate**; angular-obovate, i.e. shaped like an inverted trowel, broadest above the middle with two equal sides meeting at base and two shorter straight sides meeting at apex.

obturator: a small protuberance, generally of placental origin, which grows into the space between **nucellus** and **integument**, or between the ovule and the ovary wall.

obtuse: blunt or rounded at the end.

obvolute: of a leaf folded along the midline with one margin overlapping one margin of a similarly folded leaf on the opposite side, i.e. half-**equitant**.

ocellate: with a small eye; marked with two-coloured spots having a centre of one colour surrounded by a broad ring of another.

ocrea (*pl.* **ocreae**; *adj.* **ocreate**): a tubular **stipule** sheathing the stem (e.g. in *Polygonum*—Polygonaceae).

-oid (*suffix*): indicates likeness, resemblance or similarity; or something having the form or nature of something else; e.g. **racemoid**: resembling a **raceme**; **petaloid**: resembling a **petal**.

opaque: not transparent; dull, not shining.

operculate: with a cap or lid.

operculum: (1) a lid, cap or cover; (2) the thickened tips of **integuments** of certain angiosperm ovules.

opposite: (1) pertaining to leaves or branches when two are borne at the same **node** on opposite sides of the stem; (2) one part before another, as a stamen in front of a petal.

orbicular: flat with a ± circular outline.

orifice: opening.

ornithophilous (of pollination): effected by birds.

orthotropous (of an ovule): erect so that the **micropyle** points away from the **placenta**.

osseous: bony.

ostiole: an opening or pore, e.g. at the apex of the figs of *Ficus* (Moraceae).

oval: broadly **elliptic**.

ovary: that part of the **pistil** (the usually enlarged base) which contains the **ovules** and eventually becomes the fruit.

ovate: with the outline of an egg: scarcely twice as long as broad, with the broader end below the middle.

oviform: egg-shaped.

ovoid: solid shape of **ovate** outline.

ovule: the immature seed in the ovary before fertilisation.

ovulode: a sterile **ovule**.

P

palate: in **sympetalous** corollas, the raised projection of the lower lip which closes or very nearly closes the throat.

palea (*pl.* **paleae**; *adj.* **paleate**): (1) one of the chaffy scales or thin colourless bracts amongst the flowers on the **receptacle**, in Asteraceae; (2) the inner of two bracts enclosing the **floret**, in Poaceae.

paleaceous: with small membranous scales; chaffy.

pallid: pale in colour.

palmate (of a leaf): shaped like the palm and fingers of a hand (see **digitate**).

palmatifid (of a leaf): with the margin **palmately cleft** to less than

halfway to the base.

palmatilobed (of a leaf): **palmately** divided to about halfway to the midrib.

palmatipartite (of a leaf): **palmately** divided almost to the midrib.

palmatiseet (of a leaf): **palmately** divided down to the midrib.

pandurate/panduriform: fiddle-shaped.

panicle (*adj.* **paniculate**): a compound **raceme**; an **indeterminate** inflorescence in which the flowers are borne on branches of the main axis or on further branches of these.

pantoporate (of a pollen grain): with apertures scattered over the whole surface.

papilionaceous/papilionoid: applied to flowers with a 'butterfly-like' appearance, as in many Papilionoideae—Fabaceae and Polygalaceae.

papilla (*pl.* **papillae**): a soft, nipple-shaped protuberance; a type of **trichome**.

papillate: having **papillae**.

papillose: covered with minute, nipple-like protuberances.

pappus: the ring of hairs or scales around the top of the fruit (as in Asteraceae) and perhaps representing the calyx limb.

papule: a pimple or small pustule.

papulose: covered with **papillae**.

papyraceous: (1) papery; (2) white as paper.

paracarpous (of an ovary): with **carpels** joined by the margins only.

paracytic: of a **stoma** accompanied on either side by one or more subsidiary cells parallel to the long axis of the pore and guard cells.

paraphyletic (of a group of taxa): derived from a single ancestral taxon, but which does not contain all the descendants of the most recent ancestor.

paraphyses: sterile, hair-like, basally attached structures.

parasite: an organism living on or in a different organism and deriving nourishment from it (compare **epiphyte**, **saprophyte**).

parchment-like: like skin or leather.

parenchyma: plant tissue consisting of mature living cells that are relatively unspecialised in function.

parietal placentation: **placentation** with the **ovules** borne on the inner surface of the wall of the **ovary** or on intrusions of the wall that form incomplete partitions or false septa (compare **axile** and **marginal placentation**).

paripinnate: of a **pinnate** leaf without an odd terminal leaflet.

-partite (*suffix*): cleft nearly but not quite to the base.

patelliform: shaped like a knee-cap.

patent: spreading out widely, e.g. patent branches.

pauciserrate: sparsely **serrate**.

pectinate: like a comb.

pedate: resembling **palmate**, but the side lobes further divided.

pedicel (*adj.* **pedicellate/pedicelled**): the stalk of an individual flower.

peduncle (*adj.* **pedunculate/ peduncled/peduncular**): the stalk of an **inflorescence**; the common stalk (**rachis** or **axis**) of several **pedicellate** or **sessile** flowers.

pellucid: translucent.

peltate: applied to a leaf, or sometimes some other organ with a stalk, of which the stalk is attached to its undersurface instead of to its edge.

pendent/pendulous (of ovules): arising on and hanging down from an apical **placenta**.

penicillate: with a tuft of hairs at the end.

penni-parallel-veined: **pinnately** parallel-veined.

penninerved: **pinnately** nerved.

pentamerous: having parts in fives or multiples of five.

perennial: a plant whose life span extends over more than two growing seasons.

perfoliate (of a sessile leaf or bract): having its base completely wrapped around the stem.

perforate (of a pollen grain): with holes less than 1 μm in diamcter and generally situated in the **tectum**.

perianth: the floral envelope, consisting of **calyx** or **corolla** or both.

pericarp: the wall of the ripened ovary; its layers may be fused into one, or ± divisible into **epicarp**, **mesocarp** and **endocarp**.

periderm: secondary protective tissue derived from the **phellogen**, and replacing the epidermis.

perigone (*adj.* **perigonal**): see **perianth**.

perigynium (*pl.* **perigynia**): the **hypogynous setae** of Cyperaceae; the flask or **utricle** of *Carex* (Cyperaceae); any hypogynous **disc**.

perigynous: applied to the flower when the sepals, petals and stamens arise on an open **receptacle** surrounding the ovary but are not **adnate** to it (compare **epigynous**, **hypogynous**).

perisperm: nutritive tissue in an **angiosperm** seed, formed from the **nucellus** (compare **endosperm**).

persistent: remaining attached to the plant beyond the expected time of falling.

personate (of a flower, e.g. in Scrophulariaceae): with a two-lipped corolla in the form of a face, with an arched upper lip and a lower lip that protrudes into and nearly closes the throat of the corolla.

petal: see **corolla**.

petaloid/petaline: resembling **petals**.

petiolate: having a **petiole**.

petiole (*adj.* **petiolar**): leaf stalk.

petioled: having a **petiole**.

petiolode: the axis-like structure below the lamina and petiole (if any); it often bears the inflorescences at its distal end and sometimes shows powers of late elongation; it sometimes also produces roots (*Streptocarpus*—Gesneriaceae).

petiolule (*adj.* **petiolulate/petioluled**): the stalk of a **leaflet**.

phalloid: resembling a phallus.

phellem: cork.

phellogen: cork cambium.

phenotype: the physical characteristics of an organism; the outward expression of characteristics conferred on an organism by its **genotype**.

photonastic: one-sided growth in length of an organ due to the unrestricted action of light.

phyllary: an individual **bract** of the **involucre**, e.g. in the inflorescence of Asteraceae.

phylloclade (*syn.* **cladode**): a flattened foliaceous stem having the form and function of a leaf but arising in the axil of a minute, bract-like, often caducous, true leaf.

phyllode: a flattened **petiole** or leaf **rachis** with the form and functions of a leaf (compare **cladode**).

phyllotaxy: the arrangement of leaves on a stem.

phytomelanous (especially in seeds): black.

pilose: hairy with rather long, soft, simple hairs.

pin flower: in **heterostylous** plants, the flower type having the longer style (compare **thrum flower**).

pinna (*pl.* **pinnae**): a primary division of a **pinnate** leaf.

pinnate: like a feather in appearance; (of a compound leaf): with the leaflets arranged along each side of a common **rachis**; (of the venation of a leaf): with a middle vein and secondary veins arising from it on each side.

pinnate-parallel (of the venation of a leaf): **pinnate** with the secondary veins running parallel to each other.

pinnatifid: with the margin **pinnately** cleft but not to the midrib.
pinnatilobate/pinnatilobed: **pinnately** divided to about halfway to the midrib.
pinnatipartite: **pinnately** divided almost to the midrib.
pinnatisect: **pinnately** divided down to the midrib.
pinnule: the secondary or tertiary division of a leaf which is twice or thrice **pinnate**.
pistil: see **gynoecium**.
pistil head: see **style head**.
pistillate: pertaining to a flower with one or more **carpels** but no functional stamens; unisexual and female.
pistillode: a sterile **pistil**, often rudimentary.
pitted: marked with small depressions, punctate.
placenta: the part of the ovary, sometimes but not always thickened or raised, to which the ovules are attached (see also **free**).
placentation: the arrangement of **placentas**, and hence of ovules, within an ovary.
placentiferous: bearing a **placenta**.
plesiomorphic (of a character): common to the group under discussion and its ancestors.
plicate: folded back and forth longitudinally like a fan.
plumose: like a feather; with fine hairs branching from a central axis, e.g. the **pappus** of some Asteraceae.
plumule: see **embryo**.
pluri- (*prefix*): many-.
pluriseriate: in several to many rows.
pod: see **legume**.
polarised (of **endothecial** tissue of Asteraceae): with thickenings restricted to the horizontal cell walls.
pollen: the **microspores** of seed plants shed from **anthers**.
pollen carrier: see **corpuscle**.
pollen mass: pollen grains cohering into a single body; (= **pollinium**).
pollen presenter: a structural modification, usually a swelling, of the style around or below the stigma which enables pollen, shed in the bud, to be retained (e.g. in Proteaceae and Rubiaceae).
pollen sac: the chamber in an **anther** in which pollen is formed (see **anther**).
pollinarium (*pl.* **pollinaria**): the complex structure found in the flowers of many Apocynaceae where the pollen masses of two adjacent **thecae** are united for dispersal as a unit. The pollinarium consists of a small, ± globose, sticky body, the **corpuscle** which has two thin, elastic arms, the **caudicles**, each bearing one **pollinium**.
pollinium (*pl.* **pollinia**): a cohesive mass of pollen grains which are shed together and transported as a unit during pollination (e.g. in Apocynaceae and Orchidaceae).
polycarpic: applied to a plant which flowers and fruits often (compare **monocarpic**).
polyforate (of a pollen grain): with many pores.
polygamo-dioecious: with bisexual and male flowers on the same plant, and bisexual and female flowers on others.
polygamo-monoecious: with bisexual flowers and unisexual flowers of both sexes on the same plant.
polygamous: having unisexual and bisexual flowers on the same or on different individuals.
polymorphic: having more than two distinct morphological variants.
polypetalous: of flowers with petals free from each other (compare **gamopetalous**).
polyphyletic: composed of members that originated independently from more than one evolutionary line (compare **monophyletic**).
polyploid: having more than two of the basic sets of chromosomes in the nucleus (compare **diploid**, **haploid**).
pome: a fleshy (false) fruit, formed from an inferior ovary in which the **receptacle** or **hypanthium** has enlarged to enclose the true fruit.
porate (of a pollen grain): with rounded apertures (compare **colpate**, **colporate**).
pore: small, ± round aperture, e.g. on pollen grains.
poricidal: opening by pores.
poriferous: having many pores.
porrect: directed outward and forward; perpendicular to the surface.
posterior: in position nearest to the axis (compare **anterior/anticous**).
posticous: on the **posterior** side, next to the axis (compare **anticous**).
pouch: a bag, sack or receptacle of moderate size.
praemorse: apparently bitten off at the end.
precocious: appearing or developing early; often used of flowers which appear before the leaves.
prehensile: adapted for grasping, especially by wrapping around a support.
prickle: a sharp outgrowth from the bark or surface layer containing no conducting tissue.
primocane: the first season's shoot or cane of a biennial woody stem, as in many brambles (*Rubus* spp.—Rosaceae).
procumbent: trailing or lying on the ground without rooting at the nodes.
prolate (of a pollen grain): having a polar axis of greater length than the equatorial diameter.
proliferous: bearing **adventitious buds** on the leaves or in the flowers, capable of rooting and forming separate plants.
propagule: a structure with the capacity to give rise to a new plant.
prophyll: a leaf formed at the base of a shoot, usually smaller than those formed subsequently.
prostrate (*syn.* **procumbent**): trailing to lying on the ground without rooting at the nodes.
protandrous/proterandrous: with the **anthers** ripening before the **stigmas** (compare **protogynous**).
proterogynous: see **protogynous**.
protogynous: having the female sex organs maturing before the male ones (compare **protandrous**).
protrusion: something that projects or thrusts outwards or forwards.
protuberance (*adj.* **protuberant**): a bulge or swelling.
proximal: nearer to the point of attachment or origin; the converse of **distal**.
pruinose: having a whitish, waxy, powdery bloom on the surface.
psammophilous: sand-loving.
psammophyte: a plant which grows in sand or sandy soil.
pseud-/pseudo- (*prefix*): false, not genuine, not the true or typical.
pseudanthium: an inflorescence resembling a single flower (e.g. a **cyathium**).
pseudo-aril: false aril; see **arillode**.
pseudocolpus (of a pollen grain): a **colpus**-like streak.
pseudo-indusium: false indusium.
pseudobulb: a solid, above-ground, thickened or bulbiform stem, characteristic of some orchids.
pseudopetiolate: subsessile.
puberulent: minutely **pubescent**.
puberulous: slightly **pubescent**.
pubescent: covered with soft, short, erect hairs.
pulverulent: powdery.
pulvinate: cushion-shaped.
pulvinus: a swollen base or apex of the **petiole** or **petiolule**, often

glandular or responsive to touch; a cushion.
punctate: marked with dots or translucent glands.
puncticulate: very finely **punctate**.
punctiform: reduced to a mere point.
pungent: ending in a sharp, rigid point.
pusticulate: finely **pustulate**.
pustule (*adj.***pustulate**): a slight elevation like a pimple or blister.
putamen: the shell of a **nut**; the hardened **endocarp** of a **drupe**.
pyrene: a nutlet or kernel, the stone (**endocarp** plus seed) of a **drupe** or similar fruit (compare **berry**, **drupe**).
pyriform: pear-shaped.
pyrophyte: a plant adapted to survive severe fires.

Q

quadr-/quadra-/quadri- (*prefix*): four-.
quincuncial (applied to calyx or corolla lobes in the bud): a variant of **imbricate aestivation** with two lobes outside, two lobes inside, and one lobe which is overlapped on one side only.

R

raceme (*adj.***racemose**): an **indeterminate** inflorescence in which the flowers are borne on **pedicels** along an unbranched axis or **peduncle**, the terminal flowers being the youngest and last to open (centripetal development).
racemiform: having the shape of a **raceme**.
rachilla (*pl.***rachillae**): (1) the **rachis** (axis) of the spikelet in Cyperaceae and Poaceae; (2) a secondary axis, as in a **compound** leaf.
rachis (*pl.***rachises** or **rachides**) (= **rhachis**): (1) the axis of an inflorescence in which flower stalks occur at short intervals from each other, as in Poaceae; (2) the axis of a **pinnately** compound leaf, corresponding to the midrib of a simple leaf.
radial (of **endothecial** tissue of Asteraceae): with thickenings ± evenly distributed in the walls of the cells, particularly in the radial walls.
radiate: applied to flowerheads of Asteraceae with **ray** florets.
radical: applied to leaves which arise so close to the base of the stem as to appear to arise on the root.
radicant: rooting, in particular of a stem which produces **adventitious** roots.
radicle: see **embryo**.
radicular: related to the **radicle**.
ramification: the scheme of branching or separation into branches.
ramiflorous (of flowers and fruits): borne below the current leaves on recently formed woody branches (compare **cauliflorous**).
raphe (*adj.* **raphal**): the part of a stalk of an **anatropous ovule** that is fused along the side of the ovule.
raphides: mineral substances in the form of needle-shaped crystals, within the cells of plants.
ray: (1) the florets of the margin of a flowerhead of the Asteraceae when different from those of the centre or disc; (2) one of the radiating branches of an **umbel**.
recaulescence (*adj.***recaulescent**): a condition where the bract subtending a flower is not situated on the main axis on which the flower arises but on the pedicel.
receptacle (*adj.* **receptacular**; *syn.* **torus**): the extremity of the axis on which the sepals, petals, stamens and pistil, arise..
recurved: curved or curled downwards or backwards.
reduplicate (of sepals or petals): with margins **valvate** and **reflexed**.
reflexed: bent downwards or backwards.
regular (= **actinomorphic**) (of a flower, calyx or corolla): radially symmetrical, i.e. capable of being dissected into similar halves in more than one vertical plane forming mirror images (compare **irregular**, **zygomorphic**).
reniform: kidney-shaped.
repand: with the margin uneven or wavy, with shallow undulations; not as deep as **sinuate**.
repent: lying or creeping along the ground.
replicate: folded abaxially along the middle, as along the midrib of a leaf.
replum: a longitudinal partition in an ovary, formed between **parietal placentas** (e.g. in Brassicaceae).
resin (*adj.* **resinous**): plant exudate, often sticky, insoluble in water.
resiniferous: yielding **resin**.
resupinate: upside down because the pedicel or ovary is twisted through 180° (as in flowers of Orchidaceae and Lobeliaceae).
reticulate: having a network-like pattern; net-veined, with the smallest veins of a leaf connected together like the meshes of a net.
retinaculum (*pl.* **retinacula**), **retinacle**: (1) the persistent, hook-like **funicle**, as in the fruits of the Acanthaeeae; (2) the structure to which the **pollinium** is attached, as in the Asclepiadaceae and Orchidaceae (see **corpuscle**).
retrofracted: bent abruptly backwards.
retrorse: bent abruptly backwards, away from the apex (compare **antrorse**).
retuse: notched.
revolute: rolled back from the margin (compare **involute**).
rhachilla: see **rachilla**.
rhachis: see **rachis**.
rhipidium (*pl.* **rhipidia**; *adj.* **rhipidial**): a ± fan-shaped **cyme** with the lateral branches developed alternately on one side and then on the other.
rhizome (*adj.* **rhizomatous**): a rootstock or root-like stem prostrate on or under the ground, sending rootlets downwards, and branches, leaves or flowering shoots upwards, always distinguished from a true root by the presence of buds, leaves or scales.
rhombic/rhomboid: ± diamond-shaped; having straight margins and being widest in the middle.
riparian: of, inhabiting or situated on the bank of a river or stream.
rootstock: a short swollen structure at the junction of the root and the shoot system of a plant.
rosette: a crowded, circular cluster of leaves or other organs.
rostellum (in Orchidaceae): a projection of the upper edge of the **stigma** in front of the **anthers**; a small beak.
rostrate: beaked (see **beak**).
rostrum: any **beak**-like extension.
rosulate: with the leaves in a circle or **rosette**.
rotate: wheel-shaped; of a corolla with a short tube and spreading **limb**.
rotund: with a shape between orbicular and broadly elliptic.
rounded: margins and apex forming a smooth arc.
ruderal: a plant that grows on waste ground.
rudimentary: poorly developed and not functional (compare **obsolete**, **vestigial**).
rufescent: becoming reddish.
rufous: rusty or brownish red.
rugose: wrinkled; covered with coarse **reticulate** lines.
rugula (*pl.* **rugulae**): a fine wrinkle or fold, e.g. in the upper lip of some Acanthaceae.
rugulose: finely wrinkled.
ruminate: mottled in appearance, e.g. of bark, or of the food reserves in a seed.
runcinate: **pinnatifid** with the lobes pointing towards the base.
runner: a slender, prostrate or trailing stem which produces roots

and sometimes erect shoots at its nodes (compare **stolon**).

S

saccate: pouched.

sagittate: applied to the base of a leaf or an anther with two acute, straight lobes directed downwards like in an arrow-head.

saliciform, salicoid: like the genus *Salix* (Salicaceae); willow-like.

salverform/salver-shaped: shaped like a trumpet, e.g. of a **sympetalous corolla**, with a slender tube and an abruptly spreading **limb**.

samara: an indehiscent, 1-seeded fruit or **mericarp** with wings (e.g. *Securidaca* (Polygalaceae) and Malpighiaceae).

samaroid: applied to a fruit resembling a **samara**.

saponins: a group of soap-like, toxic substances.

saprophyte: an organism deriving its nourishment from dead organic matter and usually lacking chlorophyll (compare **epiphyte**, **parasite**).

saprophytic: obtaining food from nonliving organic matter.

sarcotesta: the fleshy outer coat of a seed.

saxicolous: living or growing among or on rocks.

scaberulous/scabrellous: minutely **scabrous**, slightly rough to the touch.

scabrid/scabrous: rough to the touch, usually from the presence of very short harsh hairs.

scabridous/scabridulous: somewhat rough to the touch.

scalariform: having a ladder-like pattern.

scale: (1) reduced or rudimentary leaf, usually **sessile** and **scarious** and seldom green; (2) a kind of **indumentum** in the form of small, flat discs attached by the centre; (3) any thin, usually small and dry structure.

scalloped: see **crenate**.

scandent: climbing.

scape: a naked flower stalk arising from the ground with **radical** or **rosulate** leaves.

scapigerous: possessing a **scape**.

scapose: bearing one or more flowers on a **scape**; in the form of a **scape**.

scarious: thin and dry, not green.

schizocarp (*adj.* **schizocarpic/schizocarpous**: a dry, dehiscent fruit which splits into two or more separate carpels (**mericarps**) at maturity, found e.g. in Apiaceae and Malvaceae.

schizogenous: originating by separation of cell walls along the middle lamella.

scimitar-shaped: see **acinaciform**.

sclereid: sclerenchyma cell having thick, lignified secondary walls.

scleroid: having a hard texture.

sclerophyllous: with leaves stiffened by sclerenchyma.

sclerotic: having **sclereids**.

scorpioid (of a **cymose** inflorescence): with the main axis coiled in bud, the flowers being usually 2-ranked, i.e. with single flowers alternately right and left (compare **helicoid**).

scrobiculate: pitted; marked by minute or shallow depressions.

scutate: like a small shield.

scutelliform: shaped like a dish.

sectile (of **pollinia**): compartmented.

secund: with parts or organs (branches, leaves or flowers) all directed to one side.

segment: a part or division of an organ.

sepal: see **calyx**.

sepaloid/sepaline: resembling sepals.

septal (of a **nectary**): occurring in the partitions of the ovary where the carpel walls are incompletely fused, especially in monocotyledons.

septate: divided by one or more partitions.

septicidal: referring to the dehiscence of a ripe **capsule** which splits open through the **septa** or **carpel** margins (compare **loculicidal**).

septifragal: referring to the **dehiscence** of a ripe **capsule** where the valves or backs of the **carpels** break away leaving the **septa** intact.

septum (*pl.* **septa**; *adj.* **septal**): dividing cross wall or partition; an internal partition of an ovary or fruit.

seriate: in rows or whorls.

sericeous: silky, with closely appressed, soft, straight hairs.

serrate: toothed like a saw, with regular, pointed teeth.

serrature: the toothing of a **serrate** leaf.

serrulate: **serrate** with minute teeth.

sessile: without a stalk; (of a **stigma**): the **style** is absent and the stigma is therefore sessile on the ovary).

seta (*pl.* **setae**): a bristle or stiff hair.

setaceous: having bristle-like hairs; bristly.

setiferous: bearing **setae**.

setiform: looking like a **seta**.

setose: beset with bristles.

setulose: a diminutive of **setose**.

sexine: the outer and/or sculptured layer of the **exine** of a pollen grain.

sheath: the (lower) portion of the leaf clasping the stem.

sigmoid/sigmoidal: double-curved in opposite directions, like the letter S.

siliceous: containing silica.

silicula (*pl.* **siliculae**): a short **siliqua**, not much longer than broad.

siliqua/silique (*pl.* **siliquae/siliques**): a dry, dehiscent fruit formed from a superior ovary of two carpels, with two parietal placentas, divided into two compartments by a thin partition (**replum**), opening by two **valves** which fall away from a frame on which the seeds are borne (e.g. in Brassicaceae).

simple: of one piece or series, the opposite of **compound**, e.g. simple leaf: not divided into leaflets; (of a hair or inflorescence): not branched.

sinistrorse: turned towards the left (compare **dextrorse**).

sinuate/sinuous: with the margin uneven, with rather deep undulations (compare **undulate**).

sinus (*pl.* **sinuses**): (1) a curve; (2) a recess between the teeth or lobes on a margin; (3) the recess formed by the basal lobes of a leaf or other organ.

siphonostele (*adj.* **siphonostelic**) (in a dicotyledonous stem): the cylinder of conducting tissue surrounding the central **parenchyma**.

sobole: a shoot, especially from the ground.

soboliferous: bearing **soboles**.

solitary: borne singly or alone.

sorus (*pl.* **sori**; *adj.* **soral**): a cluster of spores and/or **sporangia**.

spadix (*pl.* **spadices**): a flower **spike** with a fleshy or thickened axis, e.g. in Araceae and some palms (Arecaceae).

spathe (*adj.* **spathaceous/spatheate**): a large bract enclosing a **spadix**, or one or more bracts enclosing a flower or inflorescence.

spathella (*pl.* **spathellae**): (1) a capsule-like structure enclosing the flower buds in some Podostemaceae, rupturing irregularly as the pedicel elongates at **anthesis**; (2) formerly used term for the glumes of Poaceae; (3) small bracts as found in the inflorescences of Restionaceae.

spatheole: a secondary **spathe** within a **compound inflorescence** in the Andropogoneae—Poaceae.

spathulate: spoon-shaped, broadly rounded above and long and narrow below.

spatulate: see **spathulate**.

species: a **taxon** comprising one or more populations of individuals capable of interbreeding to produce fertile offspring.

spheroid/spheroidal: approximately spherical.
spicate: arranged in a **spike**.
spiciform raceme: **spike**-like **raceme**.
spiculate: having a surface covered with fine points or crystals.
spicule: a small spike.
spike: an inflorescence with the flowers **sessile** along a simple undivided axis or rachis.
spikelet: a small **spike** composed of one or more flowers enclosed by **glumes**, in Cyperaceae and Poaceae.
spine: a sharp-pointed, hardened structure modified from another organ (leaf, branch, stipule, etc.), or from part of an organ.
spine shield: in some Euphorbieae—Euphorbiaceae, the hardened bases along the angles of the stems and branches, from which the **spines** of certain species are produced.
spinescent: spine-tipped, having **spines**.
spinose: spiny or having **spines**.
spiral (of leaves or floral organs): borne at different levels on the axis, in an ascending spiral.
spiraperturate (of a pollen grain): with one or more spiral apertures.
-sporangiate (of an **anther**): containing a given number of **microsporangia/pollen sacs** (e.g. 4-sporangiate: containing four pollen sacs, as commonly found in 2-**thecate** anthers) (see **anther**).
sporangium (*pl.* **sporangia**): a hollow, unicellular or multicellular, sac-like, spore-producing structure.
sporophore: any structure bearing spores.
sporophyll: a modified leaf or leaf-like structure which bears **sporangia**.
spur: a slender, usually hollow extension of some part of the flower.
spurious: not genuine or real, false.
spur shoot: a (very) short lateral branch (= **brachyblast**).
squama (*pl.* **squamae**): a scale, usually derived from a leaf.
squamella: diminutive of **squama**, a scale of the second order or reduced in size, as in the **disc** of Asteraceae.
squamiform: scale-like.
squarrose: spreading or recurved at some point above the base, e.g. as in the **phyllaries** of some Asteraceae which are sharply curved downward or outward.
stamen (*adj.* **staminal**): in **angiosperms**, the pollen-producing structure in a flower usually consisting of an **anther** and a **filament**.
staminal column: see **androphore**.
staminal corona: fleshy outgrowth of tissue, attached dorsally to the staminal column at the base of the filament or on the backs of the anthers (compare **gynostegial corona**, **interstaminal corona**).
staminate: having stamens (usually implying that **carpels** are absent).
staminode (*adj.* **staminodial**): an abortive or vestigial **stamen** without a perfect anther.
staminophore: a structure bearing stamens.
standard: the large posterior petal (outside in the bud) of a **papilionaceous** corolla (= **vexillum**).
stele: the portion of the plant body which comprises the vascular system (xylem and phloem) and its associated ground tissue (e.g. pericycle, interfascicular regions and pith).
stelidium (*pl.* **stelidia**): lateral horn- or tooth-like appendages of the **gynostemium** of some Orchidaceae (e.g. *Bulbophyllum* spp.).
stellate: resembling a star in shape; (of hairs): with several arms radiating horizontally.
stereome (of **involucral bracts** of some Asteraceae): the thickened region in the lower part.
stigma (*adj.* **stigmatic/stigmatose**): the point or surface of the **pistil** which receives the pollen, either sessile (when there is no style) or on the top or surface of the **style** or its branches.
stipe/stipes (*pl.* **stipites**): the stalk supporting a **carpel** or **gynoecium**, or (in Orchidaceae) the stalk connecting the **viscidium** with the **caudicles** of the **pollinia**.
stipel/stipella (*pl.* **stipellae**): small secondary **stipule** at the base of a leaflet.
stipitate: supported on a special stalk, or **stipe**, e.g. an ovary (e.g. in Capparaceae).
stipi(ti)form: looking like a **stipe**.
stipule (*adj.* **stipular**): leaf-like or scale-like appendage of a leaf, usually at the base of the petiole.
stipuloid: **stipule**-like.
stolon: a **runner** which roots.
stoloniferous: having **stolons**; trailing over the soil surface and rooting at the nodes.
stoma (*pl.* **stomata**): a minute pore in the epidermis of leaves, providing for gaseous exchange between the tissues and the atmosphere.
stomatose: possessing stomata.
stone cell: a ± isodiametric **sclereid**.
stramineous: straw-like or straw-coloured.
stria (*pl.* **striae**): see **striation**.
striation (*adj.* **striate**): one of a number of parallel longitudinal lines, grooves or ridges.
strigillose: finely **strigose**.
strigose: with short stiff hairs appressed to the surface.
strigulose: minutely **strigose**.
strobiliform: resembling a **strobilus**.
strobilus (*pl.* **strobili**): a cone-like structure containing the reproductive organs of one or both sexes, as in gymnosperms.
strophiole: an appendage to the **hilum** of some seeds (see also **caruncle**).
strumose: with a swelling.
strut: a rod or bar connecting parts of a structure.
style: narrow upper part of an **ovary** supporting the **stigma**.
style head/pistil head: the dilated apical part of the style or **gynostegium**, particularly in Apocynaceae.
stylidium/stylodium: a style-like **stigma**.
stylopodium: a disc-like enlargement of the base of the style (e.g. in some Brassicaceae).
sub- (*prefix*): implying 'almost', e.g. **subacute**: almost acute; **subentire**: having a very slightly uneven margin.
suberous: corky.
subtend: to have a **bud** or similar part growing in its **axil**.
subulate: awl-shaped: narrow and tapering gradually to a fine point.
succulent: a plant which accumulates water in fleshy, water-storing stems, leaves or roots; juicy, fleshy in reference to texture or appearance.
suffrutescent: like a **suffrutex**.
suffrutex: a perennial plant which is slightly woody only at the base.
suffruticose: shrubby.
sulcate: grooved, furrowed.
sulculus (*pl.* **sulculi**; *adj.* **sulculate**) (of a pollen grain): an elongated latitudinal ectoaperture not situated at a pole (compare **sulcus**).
sulcus (*pl.* **sulci**) (of a pollen grain): an elongated latitudinal ectoaperture situated at the distal or proximal pole of a pollen grain (compare **colpus**, which is usually a longitudinal aperture; compare **sulculus**, which is not situated at a pole).
superior: applied to an **ovary** when the sepals, petals and stamens

are inserted below it (**hypogynous**); also when the **receptacle** bearing the calyx, corolla and stamens is prolonged so as to be separate from the ovary, but forms a cup surrounding it (**perigynous**) (compare **inferior**).

supra (*prefix*): above, on the upper side.

suture: the line of junction or seam of union, commonly used of the line of opening of a **carpel**; the dorsal (outer or anterior) suture of a carpel represents the midrib of the carpellary leaf; the ventral (inner) suture represents the united margins on which the ovules and placentas are borne.

sward: lawn; continuous grass cover produced by stoloniferous species.

syconium: a multiple fruit, or **syncarp**, with a hollow centre, e.g. the figs of *Ficus* (Moraceae).

sympetalous: having petals which are partly or completely fused (*syn.* **choripetalous**, **gamopetalous**) (compare **polypetalous**).

sympatric (of two or more taxa): having coincident or overlapping ranges of distribution (compare **allopatric**).

sympodial (of growth): without a single persisting growing point; changing direction by frequent replacement of the growing apex by a lateral growing point below it (compare **monopodial**).

synandrium: an **androecium** of a male flower with united anthers.

synanthous (of leaves): appearing together with the flowers (compare **hysteranthous**).

syncarp/syncarpium: a structure consisting of several united, usually fleshy fruits; (compare **aggregate fruit**).

syncarpous: composed of two or more united **carpels**.

synflorescence: a compound **inflorescence**.

synthecate (of anthers): with the two **thecae** having merged into one, e.g. in some Scrophulariaceae.

T

tannin: a complex yellowish or brownish aromatic compound found in many plants.

tanniniferous: producing **tannins**.

taproot: the main, descending root of a plant that has a single dominant root axis.

taxon (*pl.* **taxa**): a group or category, at any level, in a system for classifying organisms.

tectum (of a pollen grain): the outermost closed layer of the **sexine**, formed by union of the heads of the bacula.

tendril (*adj.* **tendrillar/tendrillous**): a long, slender, coiling, modified leaf, or rarely stem, by which a climbing plant attaches to its support.

tendrilliform/tendrilloid: resembling a **tendril**.

tenui- (*prefix*): slender, thin.

tenuous: thin or slender in form.

tepal: any of the members of a **perianth** that is not clearly differentiated into **calyx** and **corolla**.

terete: cylindrical, circular in transverse section.

terminal: at the apex or **distal** end.

ternate: arranged in a **whorl** or cluster of three.

ternately compound (of a leaf): with **leaflets** in threes.

terrestrial: on or in the ground.

tessellate: having a checkered pattern, e.g. with depressions.

testa: the outer coat of a seed.

tetra- (*prefix*): four-.

tetrad: a group of four spores or pollen grains derived from a spore mother cell or pollen grain mother cell as a result of meiosis, and remaining fused at maturity, e.g. in Ericaceae (compare **monad**).

tetradynamous: having six **stamens**, two of which are shorter than the others, as in most Brassicaceae.

tetragonous: 4-angled.

tetramerous: having four members in a whorl.

tetrandrous: having four **stamens**.

tetrasporangiate (of an **anther**): having four **microsporangia** or **pollen sacs**.

thalloid: resembling or shaped like a **thallus**.

thallus: a single plant body not differentiated into stem and leaves, e.g. *Lemna* spp. (Lemnaceae).

theca (*pl.* **thecae**; *adj.* **thecous/thecate**): one half of an **anther**, usually containing two **pollen sacs/microsporangia**.

thorn: a modified plant organ, especially a stem, that is stiffened and ends in a pungent point.

throat (of a tubular **corolla**): the top of the tube, where the lobes arise from the tube.

thrum flower: in **heterostylous** plants, the flower type having the shorter **style** (compare **pin flower**).

thyrse: a **panicle** with the secondary and ultimate axes **cymose**, i.e. the main axis is **indeterminate** and the lateral branches are **determinate** in their growth.

thyrsoid: like a **thyrse**.

tiller: a shoot growing from the base of a grass (Poaceae) stem; to produce tillers.

tomentellous/tomentulose: minutely **tomentose**.

tomentellum: a fine, short **tomentum**.

tomentose: densely covered with short, soft, felted hairs.

tomentum: a covering of woolly, densely matted hairs; wool.

toothed: see **dentate**.

tortuous: irregularly twisted or twining.

torulose: cylindrical with contractions or swellings at intervals.

torus: see **receptacle**.

trabeculate: cross-barred.

trace: a strand of vascular tissue connecting the stem with a leaf or reproductive organ.

translator: see **corpuscle**.

translator arm: see **caudicle**.

trapeziform: a figure of four straight, unequal sides.

tri- (*prefix*): three; thrice.

triad: a group of three.

trichome: an epidermal outgrowth, such as a hair or scale.

trichotomous: forking regularly into three.

trifid: deeply divided into three parts.

trifoliate: having three leaves.

trifoliolate: having three **leaflets**.

trigonous: triangular in cross section and with obtuse angles (compare **triquetrous**).

trilete (e.g. of spores): having three scar lines forming a 'Y', or basically tetrahedral.

trimerous: in threes, e.g. of a flower with three sepals, three petals, etc.

tripartite: divided into three parts.

tripinnate (of leaves): thrice **pinnately** divided.

triporate: with three pores.

triquetrous: triangular in cross section and with acute angles, therefore with three distinct longitudinal ridges (compare **trigonous**).

tristichous (of leaves on a stem): arranged in three vertical rows.

tristylous (said of a **heterostylous** species): having three style lengths (short, mid, long); the flowers of any one plant having styles of the same length.

trullate/trulliform: trowel-shaped; having its widest axis below the middle and with straight margins.

truncate: cut off ± squarely at the end.

tuber: (1) a thickened branch of an underground stem, which produces buds; (2) a swollen root or branch of a root aeting as a storage organ.
tubercle: a small, wart-like outgrowth.
tuberculate: covered with wart-like protuberances or knobs.
tuberous: swollen; (of roots): **tuber**-like.
tuft (*adj.* **tufted**): clump, cluster.
tuft domatium: a **domatium** supplied with or consisting of hairs.
tumid: swollen, enlarged.
tumulus (*pl.* **tumuli**): a small mound.
tunic (*adj.* **tunicate**) (of a **bulb** or **corm**): a loose membranous or fibrous outer skin which does not develop from the epidermis.
turbinate/turbiniform: shaped like a top; obconical.
turgid: swollen due to a high water content (compare **flaccid**).
turion: (1) a young shoot or sucker which is produced from an underground stem; (2) a perennating winter bud which is separated from the parent and gives rise to a new plant in spring.
tussocky: tufted as in some grasses or grass-like plants.

U

umbel (*adj.* **umbellate**): a **racemose** inflorescence in which all the divergent pedicels or **rays** arise in a cluster at the top of the peduncle and are of about equal length; **compound umbel**: each ray bears an umbel, each of the latter called a partial umbel; **simple umbel**: each ray terminates in a flower.
umbellule: a secondary **umbel** in a compound umbellate inflorescence.
umbo (*adj.* **umbonate**): a blunt or rounded projection arising from a surface, as on a pine-cone scale.
uncinate: terminating in a hooked point.
undulate: wavy on the margin (compare **sinuate**).
unguiculate (of petals): having a narrow **claw**-like base.
uni- (*prefix*): one-.
unifacial: one-faced; (of leaves): folded sharply in half along the midline so that the adaxial surface is hidden; or filiform to ± cylindrical with a ± continuous palisade layer (see also **centric**).
unifarious (of the **indumentum** of a stem): restricted to one side or vertical line.
unifoliate: having only one leaf.
unifoliolate: of a **compound** leaf which is reduced to a single, usually terminal, **leaflet**; the **petiolule** is distinct from a **petiole**.
unilateral (of stamens): with **anthers** grouped on one side of the **style**.
unilocular (of an ovary or fruit): having only one internal cavity.
unisexual: bearing only male or only female reproductive organs.
united: fused together.
unitegmic (of an **ovule**): with one **integument**.
unithecate/unithecous (of an **anther**): with one **theca**.
urceolate: urn-shaped, with a short swollen tube contracted near the top and then slightly expanded in a narrow rim.
urticate: to cause a burning or itching sensation.
utricle: bladder-shaped structure, applied (1) to the traps of *Utricularia* (Lentibulariaceae); (2) to the fruits of e.g. some Cyperaceae, such as *Carex*, and of Lemnaceae.

V

vagina: sheath.
vallecular (of grooves between ridges): e.g. in the fruits of Apiaceae and Asteraceae.
valvate: having the edges of **petals** or **sepals** touching without overlapping
valve (*adj.* **valvar**): one of the parts produced by the splitting of a **capsule** when ripe.
vascular: specialised for the conduction of fluids; **vascular plant**: plant containing specialised conducting tissues.
vegetative (of plant organs or parts): having non-reproductive functions, e.g. leaves, roots, stems, etc.
veins: strands of **vascular** tissue (compare **nerves**).
velamen: water-retaining outer layer of the aerial roots of some epiphytes, especially Orchidaceae.
velum: a veil; a membranous covering.
velutinous: velvety.
velvety: with a coating of fine soft hairs.
venation: the arrangement of **veins** of a leaf or other organ.
venose: having veins.
ventral (of a lateral organ): the upper or inner face or the surface facing the axis; (of a **thallus**): the surface facing the substrate (compare **dorsal**).
ventricidal: of the dehiscence of a fruit which splits down the **ventral** (axile) side of the locules.
ventricose: swollen or bulging on one side; unequally inflated.
vermiform: shaped like a worm.
vernation: the arrangement of unexpanded leaves in a bud (compare **aestivation**).
verruciform: resembling a wart.
verrucose: warty.
verruculose: finely warty.
versatile (of an **anther**): swinging freely about the point of attaehment to the **filament** which is ± in the middle of the back (compare **basifixed**, **dorsifixed**, **medifixed**).
verticil: a whorl or circular arrangement of similar parts around an axis, at the same level.
verticillaster: a false **whorl** of opposed dense **cymes**, especially in Lamiaceae.
verticillate: arranged in one or more **whorls**.
vescicle: a small sac or cavity; a spherical body.
vescicular: pertaining to, having, or composed of, **vescicles**.
vestigial: of an organ now degenerate and of little or no utility (compare **obsolete**, **rudimentary**).
vestiture: any covering on a surface, e.g. plant **trichomes**.
vexillum (*adj.* **vexillary**): the uppermost (or posterior) **petal** of a **papilionaceous** flower (= **standard**).
vibratile: capable of vibration.
villous: beset with long, weak hairs (compare **hirsute**).
virgate: with many long, slender, ± straight, ascending, almost parallel stems.
viscid: sticky, glutinous.
viscidium (in Orchidaceae): a **viscid** part of the **rostellum**, which is clearly defined and removed with the **pollinia** as a unit, and serves to attach thc pollinia to an insect or other pollination agent.
viscidulous: slightly sticky.
viscous (of a liquid): thick and sticky.
vitta (*pl.* **vittae**): aromatic oil tubes in the fruit of some Apiaceae.
viviparous: with seeds or buds germinating or sprouting while attached to the parent plant.
voluble: twining or twisting.

W

whorl (*adj.* **whorled**): (1) a group of three or more parts at a **node**, e.g. leaves or branches; (2) a circle of floral organs, e.g. stamens, petals, carpels.
wing (*adj.* **winged**): (1) any flat membranous expansion; (2) a thin

flange of tissue extended beyond the normal outline of a stem or petiole; (3) one of the two lateral petals of a **papilionaceous** flower; (4) one of the **petaloid** sepals of the flower in Polygalaceae.

X

x/basic chromosome number: the number of chromosomes in the original **genome** (**haploid** set) from which a **polyploid** or a group of polyploid forms or species is known or postulated to have arisen.

xerochastic: applied to plants of which the fruits burst by desiccation and their seeds or spores are scattered.

xeromorphic (of plants or plant parts): having characteristics that serve as protection against excessive loss of moisture.

xerophyte (*adj.* **xerophytic**): a plant that is adapted to dry or arid habitats.

Z

zonasulculate (of a pollen grain): with a ring-like **sulcus** around the equator.

zonatriporate (of a pollen grain): with three pores equatorially.

zygomorphic: applied to flowers which are bilaterally symmetrical, i.e. capable of being bisected into identical halves in one plane only, forming mirror images; (= **irregular**) (compare **actinomorphic**, **regular**).

INDEX TO FAMILIES AND GENERA

Current names of local families are in LARGE CAPITAL LETTERS; synonyms are in *italic* type. Exotic taxa are marked with an asterisk.

The following symbols and the order are given for current families to indicate their placing in the classification system according to APG II (2002, *Botanical Journal of the Linnean Society* 141: 399–436) outlined on pp. 3–4: A—asterids; Ce—core eudicots; com—commelinids; E—eudicots; Ea—euasterids (I and II); Eur—eurosids (I and II); G—gymnosperms; M—monocots; mag—magnoliids; ?—position uncertain; unplaced families are listed after asterids on p. 4.

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About SABONET

This publication is a product of the Southern African Botanical Diversity Network (SABONET), a programme aimed at strengthening the level of botanical expertise, expanding and improving herbarium and botanic garden collections, and fostering closer collaborative links among botanists in the southern African subcontinent.

The main objective of SABONET is to develop a strong core of professional botanists, taxonomists, horticulturists, and plant diversity specialists within the ten countries of southern Africa (Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe). This core group will be competent to inventory, monitor, evaluate, and conserve the botanical diversity of the region in the face of specific development challenges, and to respond to the technical and scientific needs of the Convention on Biological Diversity.

To enhance the human resource capacity and infrastructure available in the region, SABONET offers training courses, workshops, and collaborative expeditions in under-collected areas. The programme produces a newsletter, *SABONET News*, and a series of occasional publications, the Southern African Botanical Diversity Network Report Series, of which this publication is part.

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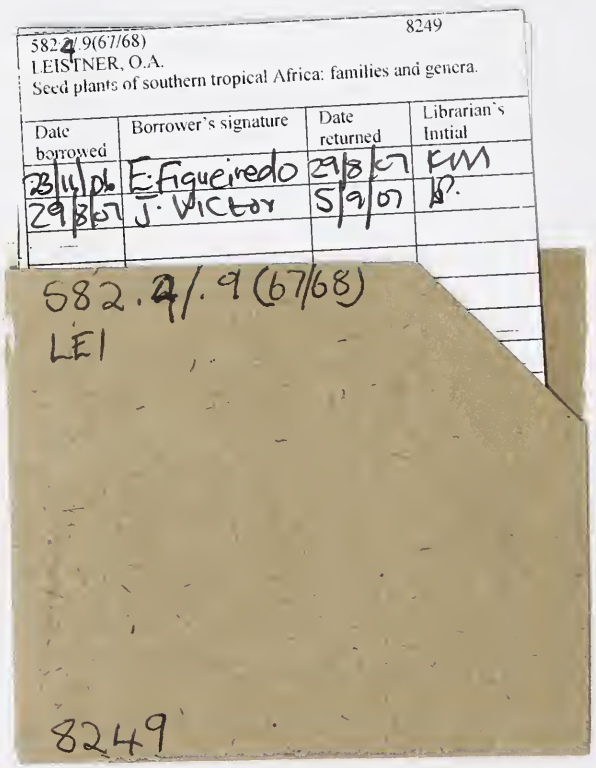

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Seed plants of southern tropical Africa documents the flora of Angola, Malawi, Mozambique, Zambia, and Zimbabwe. The flora of the five countries, as reflected here, comprises 228 families, 2,032 genera, and 11,637 species.

The book is intended as a companion volume to *Seed plants of southern Africa: families and genera,* which covered Namibia, Botswana, South Africa, Swaziland and Lesotho, and is aimed at the serious student of our botanical diversity. It provides identification keys to all families and genera of seed plants indigenous to and naturalised in the region. Families and genera are critically described, together with notes on their distribution and size, both local and worldwide, and with lists of the most important literature.

The latest views on relationships of families are reflected by means of dendrograms, and the classification of genera within the larger families is given. For easy reference, genera are arranged alphabetically within their family, and families are presented in alphabetical sequence within the three major groups: gymnosperms, dicotyledons and monocotyledons. A comprehensive glossary and an index to family and genus names conclude the work.

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